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RESEARCH ARTICLE

Social Norms for Cannabis Use After Nonmedical Legalization in Canada

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Introduction: Social norms play an important role in cannabis use; however, there is little evidence on how social norms change in jurisdictions that legalize cannabis. This study examined trends in social norms before and after legalization of nonmedical cannabis in Canada in 2018.

Methods: Data are from the International Cannabis Policy Study, a series of cross-sectional surveys conducted annually with Canadian respondents aged 16−65 years. Analyses were conducted in 2023 and included data from 58,045 respondents across 4 waves: the year immediately before legalization (2018) and 3 post-legalization waves (2019−2021). Regression models examined trends in injunctive norms (perceived approval of cannabis) and comfort in using cannabis in six different social contexts, adjusting for cannabis use frequency, medical authorization, and sociodemographic covariates.

Results: Perceived social approval of cannabis use and comfort using cannabis in different social contexts was highest among males, frequent cannabis consumers, and those who reported medical authorization ($p<0.05$ in all cases). No changes in perceived approval were observed across years, except a temporary decrease in 2020 versus 2018 (OR=0.87, 95% CI=0.80, 0.95). Modest increases in comfort of using cannabis in 6 different social contexts were observed in 2019 (ß=0.10, $p=0.001$), 2020 (ß=0.10, $p=0.001$), and 2021 (ß=0.12, $p<0.001$) versus in 2018.

Conclusions: Social norms have remained relatively stable after nonmedical legalization in Canada, with only modest increases in comfort of using cannabis in different social settings. The findings may reflect widespread cannabis use in Canada prior to nonmedical legalization in 2018 as well as comprehensive restrictions on promotion and advertising.
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INTRODUCTION

Social norms can be broadly defined as attitudes dictating what is acceptable and unacceptable behavior in a society. *Injunctive norm*s refer specifically to perceptions of what other people think is acceptable or unacceptable.[1] Social norms influence substance use, particularly among young people.[2−10] For example, higher perceived approval and peer substance use are strongly associated with greater youth smoking, alcohol use, and E-cigarette use.[6,7] Similarly, perceived norms among family and friends are consistently associated with initiation and prevalence of cannabis use among youth.[9,11−13] Conversely, a greater prevalence of use is likely to increase positive attitudes toward cannabis.[14,15]

Although social approval for cannabis use and support for more permissive policies has increased in Canada, cannabis has a history of stigmatization as an illicit drug.[2,6,10,14−18] Stigma can occur in response to negative social norms and results in disapproval and marginalization, which can exacerbate negative mental and physical health.[19,20] Concealing or hiding substance use is an indicator of negative social norms.[14,20,21] Much of the recent literature on stigma and cannabis use has focused on individuals who use cannabis for therapeutic purposes (i.e., medical cannabis). These individuals

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report differing levels of social support depending upon the social context.[21,22]

Social norms and the experience of stigma are also influenced by policies. In general, less restrictive cannabis laws are associated with greater social approval and less stigma for cannabis use.[10,23] This association between policy and stigma is bidirectional because more positive norms around cannabis use can also influence policies. An increasing number of jurisdictions have legalized nonmedical cannabis, including Canada on October 17, 2018 and >20 U.S. states. To date, few studies have examined the impact of nonmedical cannabis legalization on social norms. Two studies conducted in Washington State reported little change in social norms for cannabis among young people after legalization, with only modest changes in positive social norms among those aged >21 years.[24−26] Similarly, studies in Oregon and Colorado found increased social norms among college students immediately after nonmedical legalization, but these trends stabilized over time.[27,28] The authors are unaware of any studies examining social norms and legalization with population-based samples across a broader age range than youth and young adults.[24−28]

Overall, there is little evidence of the impact of cannabis legalization on social norms. The primary objective of this study was to examine the association between nonmedical cannabis legalization and trends in social norms surrounding cannabis use in Canada. In addition to legalizing cannabis possession at the national level, the federal Cannabis Act led to immediate changes in the cannabis retail market. Cannabis flower and some oral liquids were immediately available from legal retail stores, whereas edibles, vaping liquids, and other concentrates were available for sale beginning in December 2019. This study also examined potential differences in social norms regarding cannabis use frequency and authorization for medical cannabis. After legalization, Canadians could still pursue authorization for medical cannabis—which has been legally available since 1999—although the number of Canadians authorized has declined since nonmedical legalization.[29] Finally, this study examined changes in social norms by sociodemographic factors. The prevalence of cannabis use differs across sex and race[30−32]; however, there is a lack of research on the extent to which potential changes in norms differ across population subgroups.

METHODS

Study Sample
This study used population-based repeat cross-sectional survey data collected in Canada as part of the International Cannabis Policy Study, immediately before federal cannabis legalization (2018) and in subsequent years (2019−2021). Data were collected from respondents aged 16−65 years through self-completed web-based surveys conducted in August−September 2018, September−October 2019, September−November 2020, and September−November 2021. A nonprobability sample of respondents was recruited through the Nielsen Consumer Insights Global Panel and their partners' panels. For the International Cannabis Policy Study surveys, Nielsen draws stratified random samples from the online panels, with quotas based on age and province of residence. Upon completion, respondents received remuneration in accordance with their panel's usual incentive structure. Cooperation rate, which was calculated on the basis of the American Association for Public Opinion Research Cooperation Rate Number 2 as the percentage of respondents who completed the survey of eligible respondents who accessed the survey link, was 64.2% in 2018, 62.9% in 2019, 62.0% in 2020, and 60.8% in 2021.[33] Surveys were conducted in English or French in Canada. Median survey times were 20−25 minutes. The study was reviewed by and received ethics clearance through the University of Waterloo Research Ethics Committee (ORE#31330). A full description of the study methods is available in the Technical Reports.[34]

Measures
Respondents were classified into 4 categories on the basis of the frequency of cannabis use (medical or nonmedical): never consumer, consumed >12 months ago, past 12-month consumer or monthly consumer, and weekly or daily consumer. Respondents who had ever used cannabis were classified into 3 categories on the basis of medical cannabis authorization: never authorized, ever authorized, and currently authorized.

Respondents provided sociodemographic information, including sex at birth, age, ethnicity/race, highest education level, and perceived income adequacy. Ethnicity/race was assessed with Canadian-specific measures drawn from the census or benchmark health surveys. Income adequacy, a measure associated with objective measures of income and wealth,[35] was assessed by asking respondents, *Thinking about your family's income, how difficult or easy is it to make ends meet?* (on a 5-point Likert scale ranging from very difficult to very easy).

The first outcome, perceived social approval for cannabis, was measured using a 5-point Likert scale (Appendix Table 1, available online). Responses were recoded into a dichotomous variable (0=*Strongly disapprove/Disapprove/Neither approve nor disapprove/Don't know* versus 1=*Strongly approve/Approve*).

Concealing or hiding substance use can indicate social norms.[14,20] The second outcome, comfort using

cannabis openly, was measured using a 5-point Likert scale for each of 6 social groups: parents, boyfriend/girlfriend/partner/spouse, friends, coworkers, children, and in public (Appendix Tables 2−7, available online). Responses to each question were recoded (0=*Uncomfortable/Very Uncomfortable/Neither/Don't Know* versus 1=*Comfortable/Very Comfortable*). Among those with valid responses for at least 3 of the 6 comfort questions, responses across the 6 social settings were then summed and scaled according to the number of valid responses to create a mean Comfort Using index variable for analysis (range=0−6).

Statistical Analysis

Analyses were conducted in 2023 using SAS (SAS Studio 9.4; SAS Institute Inc, Cary, NC). Overall, 563 respondents were excluded on the basis of missing education, and 141 were excluded on the basis of missing data on injunctive norms, leaving a final analytical sample of 57,341 respondents. All estimates are weighted similarly to known population targets on the basis of age-by-sex-by-province, education, and age-by-tobacco smoking status groups. A raking algorithm was applied to the analytic sample to compute weights that were calibrated to these groupings. Weights were rescaled to the sample size for each jurisdiction.

Descriptive statistics were used to characterize the sample profile and primary outcomes. A multivariable logistic regression model was fitted to analyze perceived approval. Survey year was analyzed as an indicator variable and served as the primary independent variable in the model (with 2018 as the reference variable). The model also included the following covariates: age, sex, education, ethnicity, income adequacy, and cannabis use. Adjusted ORs, 95% CIs, and exact *p*-levels are reported for pairwise contrasts. A linear regression model was fitted to analyze the Comfort Using index variable (range=0−6). As discussed earlier, survey year was entered as an indicator variable, along with age, sex, education, ethnicity, income adequacy, and cannabis use. Adjusted betas, 95% CIs, and exact *p*-levels are reported for pairwise contrasts. An additional 5,615 respondents were excluded from the analysis of the index variable owing to missing data (i.e., responding to <3 comfort questions). As a sensitivity test, logistic regression models were run for each individual Comfort Using outcome (Appendix Tables 8−13, available online).

Both the logistic and linear regression models were rerun excluding never-cannabis consumers and with the inclusion of the medical cannabis authorization variable to assess changes in norms among consumers with and without medical authorization. In all cases, 2-way interaction terms between survey year and the other variables were added to the main effects model.

RESULTS

Of respondents who have ever used cannabis, 91.0% had never been authorized to use medical cannabis, 2.3% had been authorized to use medical cannabis at some point but not within the last 12 months, and 6.7% reported authorization in the last 12 months (Table 1). Appendix Table 1 (available online) shows the full distribution of responses for perceived social approval of cannabis. Across all years, approximately one third of respondents perceived disapproval, one quarter perceived approval, one third reported that people neither approve nor disapprove of cannabis, and up to 10% reported they did not know.

Perceived approval was relatively stable over time (Figure 1). In the adjusted logistic regression model, there was an effect of survey year (F=5.7; *p*=0.001): after adjusting for covariates, perceived approval was relatively stable from 2018 to 2019 and from 2019 to 2020 (AOR=0.93; 95% CI=0.85, 1.01; *p*=0.071 and AOR=0.94; 955 CI=0.88, 1.01; *p*=0.100, respectively). Perceived approval increased significantly from 2020 to 2021 (AOR=1.14; 95% CI=1.06, 1.22; *p*<0.001), with no difference between 2021 and 2018.

As shown in Appendix Table 14 (available online), perceived approval of cannabis was lowest among respondents aged 16−17 years (17.4%) and highest among those aged 18−30 years (29.2%; AOR=1.52; 95% CI=1.31, 1.77; *p*<.001). Females reported lower perceived approval than males (21.9% vs 25.3% approval: AOR=0.84; 95% CI=0.80, 0.88; *p*<0.001). Respondents who identified as indigenous perceived the greatest approval of cannabis compared to respondents identifying as White (34.6% vs 24.1% approval: AOR=1.32; 95% CI=1.13, 1.53; *p*=0.001), whereas those who identified as South and East/Southeast Asian reported the lowest perceived approval (18.9% approval: AOR=0.75; 95% CI=0.65, 0.88; *p*<0.001 and 15.5% approval: AOR=0.67; 95% CI=0.60, 0.74; *p*<0.001, respectively). Respondents who declined to state their income adequacy or stated that it was neither easy nor difficult to make ends meet reported the lowest perceived approval of cannabis (14.2% approval: AOR=0.53; 95% CI=0.43, 0.65; *p*<0.001 and 20.8% approval: AOR=0.79; 95% CI=0.71, 0.87; *p*<0.001, respectively), with all other income adequacy groups reporting similar levels of perceived approval. Perceived approval was positively associated with frequency of cannabis use, with highest perceived approval among daily-to-weekly consumers (37.2% approval: AOR=2.91; 95% CI=2.70, 3.14; *p*<0.001),

Table 1. Sample Characteristics

Characteristics	Unweighted, % (*n*) N=57,341	Weighted, % (*n*) N=57,341
Survey year		
2018/Wave 1	17.4% (9,982)	17.4% (9,981)
2019/Wave 2	26.3% (15,062)	26.3% (15,066)
2020/Wave 3	27.1% (15,561)	27.1% (15,557)
2021/Wave 4	29.2% (16,736)	29.2% (16,737)
Sex		
Female	60.5% (34,699)	49.9% (28,598)
Male	39.5% (22,642)	50.1% (28,743)
Age, year		
16−17	7.8% (4,475)	4.4% (2,511)
18−30	19.7% (11,310)	17.3% (9,938)
31−50	40.5% (23,213)	38.1% (21,851)
51−65	32.0% (18,343)	40.2% (23,041)
Education		
Less than high school	8.5% (4,870)	15.5% (8,905)
High school diploma or equivalent	15.6% (8,969)	26.8% (15,348)
Some college or technical/vocational training or certificate/ diploma, or apprenticeship, or some university	41.2% (23,628)	32.8% (18,778)
Bachelor's degree or higher	34.7% (19,874)	25.0% (14,310)
Ethnicity		
Black only	2.7% (1,568)	3.4% (1,947)
East/Southeast Asian only	8.0% (4,603)	8.5% (4,881)
Indigenous only	2.5% (1,438)	2.5% (1,456)
Latino only	1.5% (846)	1.9% (1,072)
Middle Eastern only	1.4% (804)	1.6% (909)
South Asian only	3.2% (1,815)	3.7% (2,117)
White only	75.2% (43,124)	72.4% (41,493)
Mixed/other/unstated	5.5% (3,143)	6.1% (3,468)
Income adequacy		
Very difficult	8.0% (4,604)	8.6% (4,917)
Difficult	19.7% (11,280)	20.0% (11,446)
Neither easy nor difficult	35.9% (20,587)	36.0% (20,647)
Easy	22.0% (12,618)	21.2% (12,165)
Very easy	11.7% (6,705)	11.0% (6,277)
Not stated	2.7% (1,547)	3.3% (1,889)
Frequency of use		
Never consumer	38.3% (21,956)	39.1% (22,440)
Consumed >12 months ago	30.0% (17,172)	26.9% (15,446)
Past 12-month consumer to monthly consumer	16.5% (9,450)	16.6% (9,492)
Daily-to-weekly consumer	15.3% (8,763)	17.4% (9,962)
Medical authorization among consumers		
Currently authorized	6.4% (2,268)	6.7% (2,318)
Ever authorized[a]	2.2% (768)	2.3% (796)
Never authorized	91.4% (32,202)	91.0% (31,611)

Note: A total of 704 respondents were excluded from the sample for missing data on perceived approval and education.
[a]Ever authorized: reported receiving medical cannabis authorization previously but were not authorized at any time in the last 12 months.

followed by past 12-month to monthly consumers, those who consumed cannabis >12 months ago, and never consumers (30.3% approval: AOR=2.20, 95% CI=2.04, 2.37, *p*<0.001; 23.0% approval: AOR=1.63, 95% CI=1.52, 1.74, *p*<0.001; and 15.1% approval, respectively). Among respondents who had ever used cannabis, those who had never been authorized to use medical cannabis reported lower perceived approval of cannabis
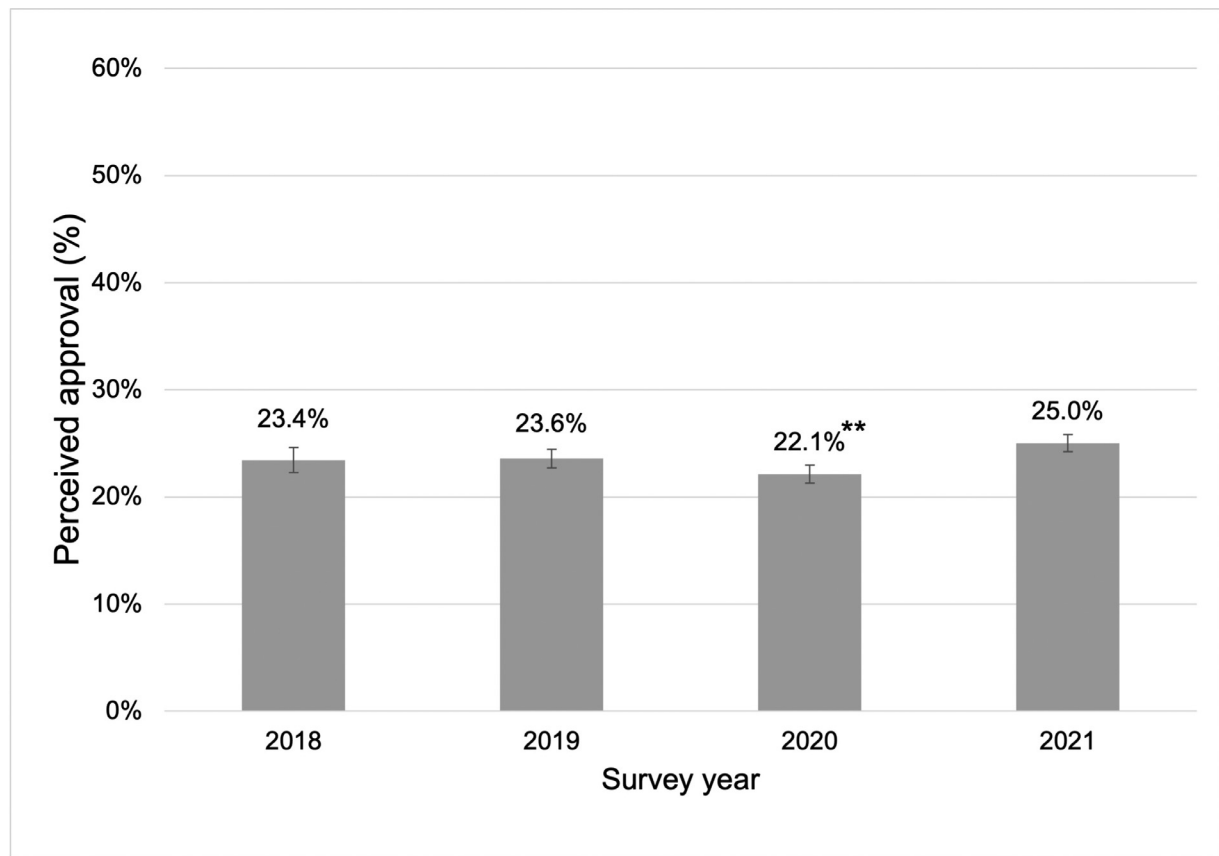
Figure 1. Perceived approval[a] of cannabis among Canadians aged 16−65 years, 2018−2021 (N=57,341).
Notes: Error bars report 95% CIs. *p*-value levels indicate effect of survey year (where 2018 is the reference) from logistic regression models conducted for approve, including survey year, sex, age, education, ethnicity, income adequacy, frequency of cannabis use, and medical authorization status among respondents that have used cannabis. Asterisk indicates the level of statistical significance for survey year with reference to 2018, where * indicates *p*<0.05, ** indicates *p*<0.01, and *** indicates *p*<0.001.
[a]Perceived approval represents the percentage of respondents perceiving that people approve or strongly approve of marijuana.

(27.9%) than those who were ever or currently authorized to use medical cannabis (38.5% approval: AOR=1.58, 95% CI=1.29, 1.93, *p*<0.001 and 41.5% approval: AOR=1.81, 95% CI=1.61, 2.03, *p*<0.001, respectively). Two-way interactions were observed between survey year and age group (F=1.9, *p*=0.049) and survey year and cannabis use (F=4.4, *p*<0.001) (Appendix Figures 1 and 2, available online). Only respondents aged 16−17 years and respondents who had never consumed cannabis reported increases in perceived approval immediately after nonmedical legalization (14.6% approval in 2018 to 19.2% approval in 2019 and 13.2% approval in 2018 to 15.7% approval in 2019, respectively). There was also a decrease in perceived approval in 2020 among those who consumed cannabis in the past 12 months or monthly (30.8% in 2019 to 25.2% in 2020).

Respondents' comfort in using cannabis openly is shown in Appendix Tables 2−7 (available online) for each of the 6 social settings. Across all years, nearly half of respondents were comfortable using cannabis around their friends and their boyfriend/girlfriend/partner/spouse (Figure 2). Approximately one fifth of respondents reported that they would be comfortable using cannabis around their parents and coworkers, compared with approximately 10% around children and 15% using cannabis in public.

In the adjusted linear regression model, the overall Comfort Using index variable differed across survey years (F=6.4, *p*<0.001) (Figure 3). Compared with the level in 2018, the mean Comfort Using level increased significantly in 2019 (mean=1.43 vs 1.66, ß=0.10, 95% CI=0.04, 0.16, *p*=0.001). No significant changes were observed in mean comfort from 2019 to 2020 or from 2020 to 2021.

Respondents aged 18−30 and 31−50 years reported the greatest mean comfort using cannabis openly (mean=1.83; ß=0.31, 95% CI=0.22, 0.40, *p*<0.001 and
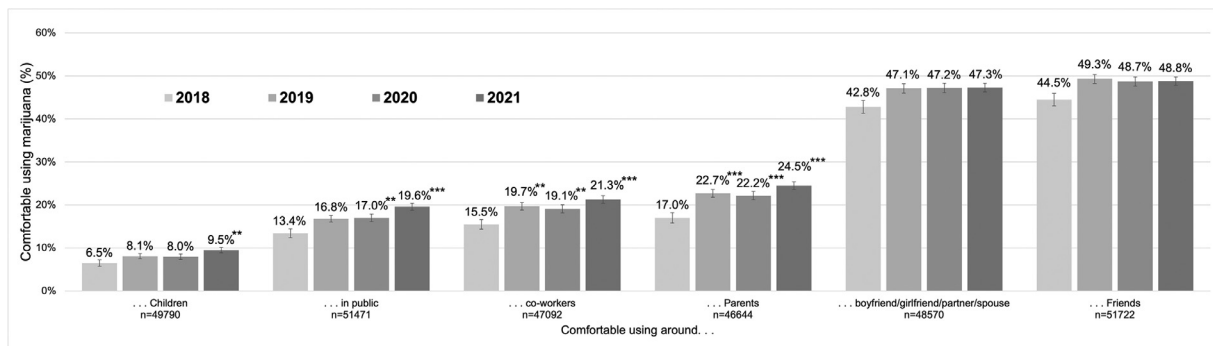
Figure 2. Comfort[a] using cannabis openly in various settings among Canadians aged 16−65 years, 2018−2021.
Notes: Error bars report 95% CIs. *p*-vlaue levels indicate effect of survey year (where 2018 is the reference) from logistic regression models conducted for comfortable, including survey year, sex, age, education, ethnicity, income adequacy, frequency of cannabis use, and medical authorization status among respondents who have used cannabis. Asterisk indicates the level of statistical significance for survey year with reference to 2018, where * indicates *p*<0.05, ** indicates *p*<0.01, and *** indicates *p*<0.001.
[a]Comfort reported as percentage of respondents who were comfortable or very comfortable using marijuana openly in that setting.

mean=1.79; ß=0.39, 95% CI=0.20, 0.38, *p*<0.001, respectively). Females also reported less comfort in using cannabis openly than males (mean=1.54 vs 1.73; ß= −0.12, 95% CI= −0.16, −0.09, *p*<0.001). Respondents who declined to state their income adequacy and those who reported that it was neither easy nor difficult to make ends meet reported the lowest mean comfort using cannabis openly (mean=1.02; ß= −0.45, 95% CI= −0.57, −0.38, *p*<0.001 and mean=1.55; ß= −0.13, 95% CI= −0.20, −0.05, *p*=0.002, respectively). Respondents who reported that it was very easy to make ends meet reported the greatest mean comfort using cannabis openly after adjusting for covariates (mean=1.71; ß=0.13, 95% CI=0.04, 0.23, *p*=0.004). Respondents who had not completed their high school diploma were significantly more comfortable using cannabis openly than respondents with a bachelor's degree or higher (mean=1.37 vs 1.61; ß= −0.26, 95% CI= −0.35, −0.18, *p*<0.001). Respondents who identified as indigenous perceived the greatest mean comfort in using cannabis openly relative to White respondents (mean=2.45 vs 1.80; ß=0.32, 95% CI=0.19, 0.46, *p*<0.001), whereas those who identified as East/Southeast Asian reported the lowest perceived approval (mean=0.93; ß= −0.27, 95% CI= −0.33, −0.21, *p*<0.001). Similar to injunctive norms, comfort in using cannabis openly was positively associated with frequency of cannabis use, with the lowest comfort level reported among never consumers and increasing comfort reported among respondents who used over 12 months ago, past 12-month to monthly consumers, and daily-to-weekly consumers (mean=0.65 vs mean=1.50; ß=0.80, 95% CI=0.75, 0.85, *p*<0.001; mean=2.28; ß=1.55, 95% CI=1.49, 1.60, *p*<0.001; and mean=3.14; ß=2.36, 95% CI=2.30, 2.41,

p<0.001, respectively). In addition, among respondents who had ever used cannabis, those who had never been authorized to use medical cannabis reported lower comfort than those who had ever and were currently authorized (mean=2.11 vs mean=2.87; ß=0.70, 95% CI=0.52, 0.88, *p*<0.001 and mean=3.21; ß=1.08, 95% CI=0.97, 1.20, *p*<0.001, respectively). Detailed regression analyses and contrasts are presented in Appendix Tables 14 and 15 (available online).

DISCUSSION

To the authors' knowledge, this study is the first to assess trends in social norms after nonmedical cannabis legalization at the national level. The perceived social approval of cannabis—a common measure of injunctive norms—appears to have changed relatively little since nonmedical cannabis legalization in Canada. Although there were no changes overall for injunctive norms from 2018 to 2021, perceived approval increased among the youngest respondents, aged 16 and 17 years. Social norms among youth may be most sensitive to the impact of cannabis legalization given the greater influence of social influences and peer groups during adolescence.[3,36,37] In contrast to the current findings, previous research from Washington did not find changes in social norms among younger respondents after legalization of nonmedical cannabis.[24,25] The reason for the discrepant findings is unclear, although the overall pattern of findings across the studies is generally consistent in showing only modest changes in social norms after nonmedical legalization.

The lack of overall change in perceived approval may reflect the widespread normalization of cannabis prior
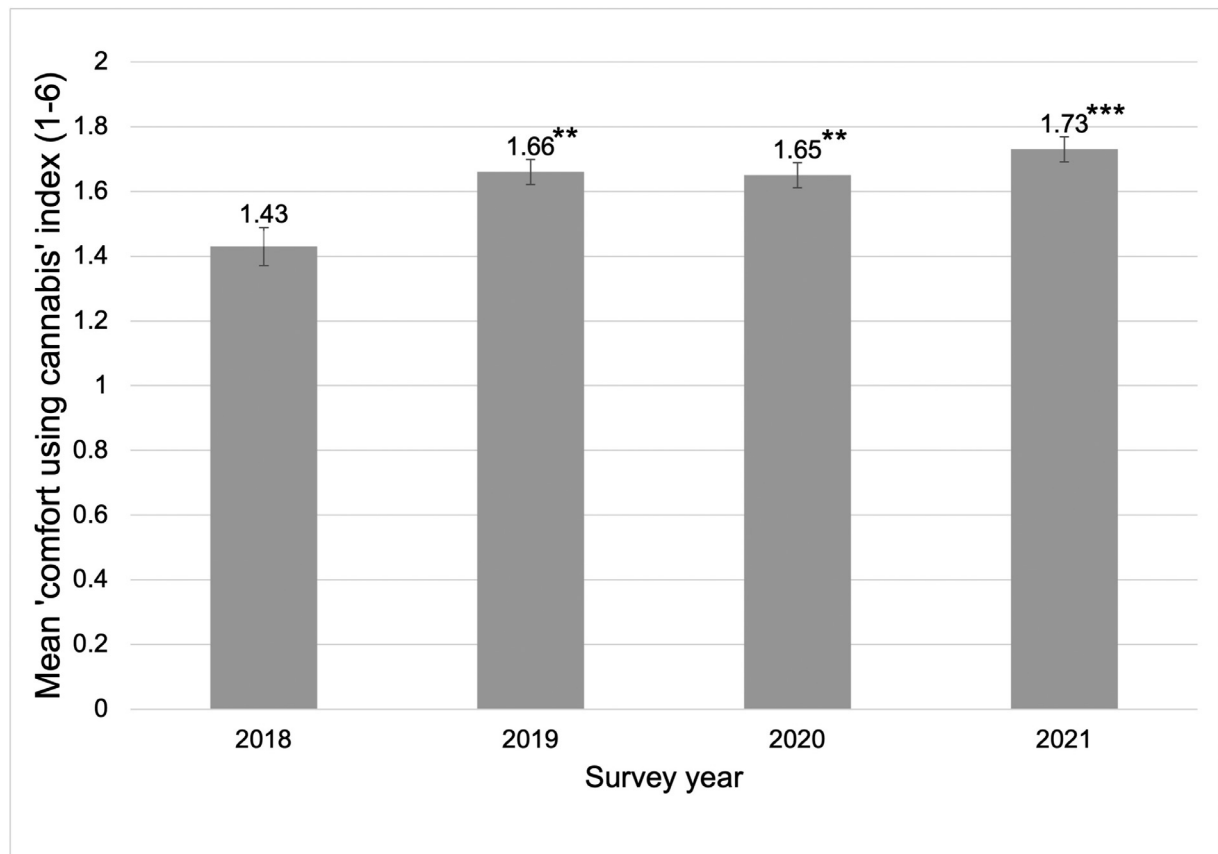
Figure 3. Mean comfort[a] using cannabis openly among Canadians aged 16−65 years, 2018−2021.
Notes: Error bars report 95% CIs. *p*-value levels indicate effect of survey year (where 2018 is the reference) from logistic regression models conducted for Comfort Using index, including survey year, sex, age, education, ethnicity, income adequacy, frequency of cannabis use, and medical authorization status among respondents who have used cannabis. Asterisk indicates the level of statistical significance for survey year with reference to 2018, where * indicates *p*<0.05, ** indicates *p*<0.01, and *** indicates *p*<0.001.
[a]Mean comfort represents mean comfort index.

to legalization. Canada has among the highest prevalence of cannabis use worldwide, and various surveys suggest that permissive attitudes were well established prior to legalization.[10,17,18] Moreover, the official date of cannabis legalization was preceded by widespread media attention, such that social attitudes may have changed in the lead up to legalization. It is also possible that Canada's comprehensive regulatory framework may have limited potential changes in social norms, particularly with respect to restrictions on advertising and promotion. Advertising and promotion are important factors that dictate social norms of substances such as tobacco and alcohol.[36,38,39] Under the federal Cannabis Act, advertising and promotion are strictly regulated, including prohibitions on advertisements in most marketing channels accessible to young people as well as restrictions on branding.[40]

Unlike perceived approval, comfort in using cannabis in different social settings increased from 2018 to 2021.

As expected, levels of comfort varied across social settings, with the highest level of comfort for close peers, including friends, family, and relationship partners. Lower levels of comfort were reported for parents, children, and coworkers, which is consistent with findings from studies of medical cannabis users and stigma experiences.[21,22] Levels of comfort in public settings remained relatively low, which may reflect the fact that cannabis use in public spaces remains prohibited under federal law.[41]

For both perceived approval and comfort in using cannabis, there were notable differences in 2020, particularly among cannabis consumers. This pattern of findings may reflect the onset of the coronavirus disease 2019 (COVID-19) pandemic, which impacted patterns of use, retail sources, and other aspect of cannabis use in Canada.[42,43] It is also possible that restrictions on social interactions and work-from-home arrangements may have influenced social norms, including comfort levels in using cannabis around others.

Limitations

As with all self-reported survey data, social desirability bias is a potential limitation. Social desirability bias may be greater prior to nonmedical legalization, leading to more negative social norms. However, responses were anonymized and self-administered online, and respondents were asked whether they were able to answer questions honestly, with those who responded no being excluded from the sample.[34] Another limitation is the use of nonprobability-based sampling. However, data are weighted to match known proportions in the Canadian population.[34] A limitation of the Comfort Using Index was that not all respondents contributed the same number of responses (e.g., if they did not have children). As a sensitivity test, models were run with each of the 6 variables separately to examine changes over time, with a similar pattern of results (see Appendix, available online). Whereas this study measured perceived approval with reference to people, future research should examine perceived approval with reference to specific peer groups.[21,22]

The repeat cross-sectional design and the pre−post design of the study are strengths. However, the first survey was only 1−3 months prior to legalization, and social norms may have changed in the lead up to legalization, particularly given widespread media coverage and discussion. In addition, 3 years after legalization represents a relatively brief follow-up period to examine changes in norms. It is likely to be a decade or more before young Canadians age into the period of cannabis use with consistent exposure to cannabis advertising and other promotional aspects of a commercial cannabis market.

CONCLUSIONS

Social norms play an important role in substance use, particularly in terms of initiation among young people. Although social norms are influenced by policy, they can also help to shape policy, including support for more or less restrictive regulatory measures in a regulated market. The current findings suggest only modest changes in social norms after legalization of nonmedical cannabis in Canada. These trends are consistent with modest increases in the prevalence of cannabis in Canada after legalization.[44] Future research should monitor changes in social norms over a longer period, including the potential role of cannabis promotion, retail density of cannabis stores, and other policy-relevant factors.

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CREDIT AUTHOR STATEMENT

Lauren Winfield-Ward: Formal analysis, Methodology, Writing — original draft. David Hammond: Conceptualization, Data curation, Funding acquisition, Methodology, Supervision, Writing — review & editing.

SUPPLEMENTAL MATERIAL

Supplemental materials associated with this article can be found in the online version at https://doi.org/10.1016/j.amepre.2023.12.013.

REFERENCES

1. Kallgren CA, Reno RR, Cialdini RB. A focus theory of normative conduct: when norms do and do not affect behavior. *Pers Soc Psychol Bull.* 2000;26(8):1002–1012. https://doi.org/10.1177/01461672002610009.
2. Sznitman SR, Taubman DS. Drug use normalization: a systematic and critical mixed-methods review. *J Stud Alcohol Drugs.* 2016;77(5):700–709. https://doi.org/10.15288/jsad.2016.77.700.
3. Wu LT, Swartz MS, Brady KT, Hoyle RH, NIDA AAPI Workgroup. Perceived cannabis use norms and cannabis use among adolescents in the United States. *J Psychiatr Res.* 2015;64:79–87. https://doi.org/10.1016/j.jpsychires.2015.02.022.
4. Eisenberg ME, Toumbourou JW, Catalano RF, Hemphill SA. Social norms in the development of adolescent substance use: a longitudinal analysis of the International Youth Development Study. *J Youth Adolesc.* 2014;43(9):1486–1497. https://doi.org/10.1007/s10964-014-0111-1.
5. Arbour-Nicitopoulos KP, Kwan MY, Lowe D, Taman S, Faulkner GE. Social norms of alcohol, smoking, and marijuana use within a Canadian university setting. *J Am Coll Health.* 2010;59(3):191–196. https://doi.org/10.1080/07448481.2010.502194.
6. East K, McNeill A, Thrasher JF, Hitchman SC. Social norms as a predictor of smoking uptake among youth: a systematic review, meta-analysis and meta-regression of prospective cohort studies. *Addiction.* 2021;116(11):2953–2967. https://doi.org/10.1111/add.15427.
7. Leonardi-Bee J, Jere ML, Britton J. Exposure to parental and sibling smoking and the risk of smoking uptake in childhood and adolescence: a systematic review and meta-analysis. *Thorax.* 2011;66(10):847–855. http://doi.org/10.1136/thx.2010.153379.
8. Romm KF, Wang Y, Ma Y, et al. The reciprocal relationships of social norms and risk perceptions to cigarette, e-cigarette, and cannabis use: cross-lagged panel analyses among US young adults in a longitudinal study. *Drug Alcohol Depend.* 2022;238:109570. https://doi.org/10.1016/j.drugalcdep.2022.109570.
9. Napper LE, Kenney SR, Hummer JF, Fiorot S, LaBrie JW. Longitudinal relationships among perceived injunctive and descriptive norms and marijuana use. *J Stud Alcohol Drugs.* 2016;77(3):457–463. https://doi.org/10.15288/jsad.2016.77.457.
10. Duff C, Asbridge M, Brochu S, et al. A Canadian perspective on cannabis normalization among adults. *Addict Res Theor.* 2012;20(4):271–283. https://doi.org/10.3109/16066359.2011.618957.

11. Patrick ME, Kloska DD, Vasilenko SA, Lanza ST. Perceived friends' use as a risk factor for marijuana use across young adulthood. *Psychol Addict Behav.* 2016;30(8):904–914. http://doi.org/10.1037/adb0000215.

12. Roditis ML, Delucchi K, Chang A, Halpern-Felsher B. Perceptions of social norms and exposure to pro-marijuana messages are associated with adolescent marijuana use. *Prev Med.* 2016;93:171–176. https://doi.org/10.1016/j.ypmed.2016.10.013.

13. Schuler MS, Tucker JS, Pedersen ER, D'Amico EJ. Relative influence of perceived peer and family substance use on adolescent alcohol, cigarette, and marijuana use across middle and high school. *Addict Behav.* 2019;88:99–105. https://doi.org/10.1016/j.addbeh.2018.08.025.

14. Becker HS. Marihuana use and social control. *Soc Probl.* 1955;3(1):35–44. https://doi.org/10.2307/798741.

15. Erickson PG, Goodstadt MS. Legal stigma for marijuana possession. *Criminology.* 1979;17(2):208–216. https://doi.org/10.1111/j.1745-9125.1979.tb01287.x.

16. Hathaway AD, Comeau NC, Erickson PG. Cannabis normalization and stigma: contemporary practices of moral regulation. *Criminol Crim Justice.* 2011;11(5):451–469. https://doi.org/10.1177/1748895811415345.

17. Senate Special Committee on Illegal Drugs. Cannabis: Our Position for a Canadian Public Policy Report of the Senate Special Committee on Illegal Drugs. Ottawa, Ontario, Canada: Senate Special Committee on Illegal Drugs; 2002. https://sencanada.ca/content/sen/committee/371/ille/rep/summary-e.pdf.

18. Hathaway AD, Erickson PG, Lucas P. Canadian public opinion on cannabis: how far out of step with it is the existing law? *Can Rev Soc Pol.* 2007;59:44–55. https://www.jstor.org/stable/45408148.

19. Weiss MG, Ramakrishna J, Somma D. Health-related stigma: rethinking concepts and interventions. *Psychol Health Med.* 2006;11(3):277–287. https://doi.org/10.1080/13548500600595053.

20. Ahern J, Stuber J, Galea S. Stigma, discrimination and the health of illicit drug users. *Drug Alcohol Depend.* 2007;88(2–3):188–196. https://doi.org/10.1016/j.drugalcdep.2006.10.014.

21. Leos-Toro C, Shiplo S, Hammond D. Perceived support for medical cannabis use among approved medical cannabis users in Canada. *Drug Alcohol Rev.* 2018;37(5):627–636. https://doi.org/10.1111/dar.12823.

22. Gliksberg O, Kushnir T, Sznitman SR, et al. Negative experiences of patients using medicinal cannabis: a systematic review of qualitative studies. *J Clin Nurs.* 2023;32(17–18):5607–5618. https://doi.org/10.1111/jocn.16653.

23. Hathaway AD. Cannabis users' informal rules for managing stigma and risk. *Deviant Behav.* 2004;25(6):559–577. https://doi.org/10.1080/01639620490484095.

24. Gilson MS, Kilmer JR, Fleming CB, Rhew IC, Calhoun BH, Guttmannova K. Substance-specific risk factors for cannabis and alcohol use among young adults following implementation of nonmedical cannabis legalization. *Prev Sci.* 2023;24(6):1047–1057. https://doi.org/10.1007/s11121-022-01435-8.

25. Blevins CE, Marsh E, Banes KE, Stephens RS, Walker DD, Roffman RA. The implications of cannabis policy changes in Washington on adolescent perception of risk, norms, attitudes, and substance use. *Subst Abuse.* 2018;12 1178221818815491. https://doi.org/10.1177/1178221818815491.

26. Stone AL. Adolescent cannabis use and perceived social norm trends pre- and post-implementation of Washington State's liberalized recreational cannabis policy: healthy Youth Survey, 2008–2018. *Prev Sci.* 2020;21(6):772–783. https://doi.org/10.1007/s11121-020-01136-0.

27. Koval AL, Kerr DCR, Bae H. Perceived prevalence of peer marijuana use: changes among college students before and after Oregon recreational marijuana legalization. *Am J Drug Alcohol Abuse.* 2019;45(4):392–399. https://doi.org/10.1080/00952990.2019.1599381.

28. Wallace GT, Parnes JE, Prince MA, et al. Associations between marijuana use patterns and recreational legislation changes in a large Colorado College student sample. *Addict Res Theor.* 2020;28(3):211–221. https://doi.org/10.1080/16066359.2019.1622003.

29. Data on cannabis for medical purposes. Health Canada. https://www.canada.ca/en/health-canada/services/drugs-medication/cannabis/research-data/medical-purpose.html. Updated April 12, 2023. Accessed May 24, 2023.

30. Spence N, Wells S, George J, Graham K. An examination of marijuana use among a vulnerable population in Canada. *J Racial Ethn Health Disparities.* 2014;1(4):247–256. https://doi.org/10.1007/s40615-014-0031-5.

31. Sartor CE, Ye F, Simon P, Zhai ZW, Hipwell AE, Chung T. Cross-substance patterns of alcohol, cigarette, and cannabis use initiation in Black and White adolescent girls. *Prev Med.* 2022;156:106979. https://doi.org/10.1016/j.ypmed.2022.106979.

32. Wu LT, Zhu H, Swartz MS. Trends in cannabis use disorders among racial/ethnic population groups in the United States. *Drug Alcohol Depend.* 2016;165:181–190. https://doi.org/10.1016/j.drugalcdep.2016.06.002.

33. American Association for Public Opinion Research. Standard definitions: final dispositions of case codes and outcome rates for surveys. 10th edition Deerfield IL: American Association for Public Opinion Research; 2023. https://aapor.org/wp-content/uploads/2023/05/Standards-Definitions-10th-edition.pdf.

34. Corsetti D, Goodman S, Burkhalter R, Hammond D. *International cannabis policy study technical report - wave 4 (2021).* Waterloo, Ontario, Canada: University of Waterloo; 2022. https://cannabisproject.ca/wp-content/uploads/2023/02/ICPS-Wave-4-2021-Tech-Report-Sept-8.pdf.

35. Litwin H, Sapir EV. Perceived income adequacy among older adults in 12 countries: findings from the survey of health, ageing, and retirement in Europe. *Gerontologist.* 2009;49(3):397–406. https://doi.org/10.1093/geront/gnp036.

36. HHS. Preventing tobacco use among youth and young adults: a report of the Surgeon General. Atlanta, GA: HHS, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2012. http://www.ncbi.nlm.nih.gov/books/NBK99237/.

37. Guttmannova K, Skinner ML, Oesterle S, White HR, Catalano RF, Hawkins JD. The interplay between marijuana-specific risk factors and marijuana use over the course of adolescence. *Prev Sci.* 2019;20(2):235–245. https://doi.org/10.1007/s11121-018-0882-9.

38. HHS. Division of cancer control and population sciences (DCCPS). National Institutes of Health. National Cancer Institute. The role of the media in promoting and reducing tobacco use. Bethesda, MD: HHS, Division of cancer control and population sciences (DCCPS), National Institutes of Health, National Cancer Institute; 2018. https://cancercontrol.cancer.gov/brp/tcrb/monographs/monograph-19.

39. Sargent JD, Babor TF. The relationship between exposure to alcohol marketing and underage drinking is causal. *J Stud Alcohol Drugs Suppl.* 2020(Sup 19)(Suppl 19)):113–124. https://doi.org/10.15288/jsads.2020.s19.113.

40. Rup J, Goodman S, Hammond D. Cannabis advertising, promotion and branding: differences in consumer exposure between 'legal' and 'illegal' markets in Canada and the US. *Prev Med.* 2020;133:106013. https://doi.org/10.1016/j.ypmed.2020.106013.

41. Cannabis regulations (SOR/2018−144). Cannabis act. Government of Canada. https://laws-lois.justice.gc.ca/eng/regulations/SOR-2018-144/FullText.html. Updated November 27, 2023. Accessed March 29, 2023.

42. Infographic: examining how changes in alcohol and cannabis consumption varied by experiences of stigma during the COVID-19 pandemic in Canada. Public Health Agency of Canada. https://www.canada.ca/en/

public-health/services/publications/healthy-living/infographic-examin-ing-changes-alcohol-cannabis-consumption-stigma-covid-pandemic.html. Updated October 31, 2022. Accessed April 25, 2023.

43. Wadsworth E, Goodman S, Hammond D. Self-reported impact of the COVID-19 pandemic on cannabis use in Canada and the United States. *J Psychoactive Drugs.* 2023;55(4):483–492. https://doi.org/10.1080/02791072.2022.2110023.

44. Cannabis use for non-medical purposes among Canadians (aged 16+). Health Canada. https://health-infobase.canada.ca/cannabis/. December 16, 2022. Accessed May 24, 2023.