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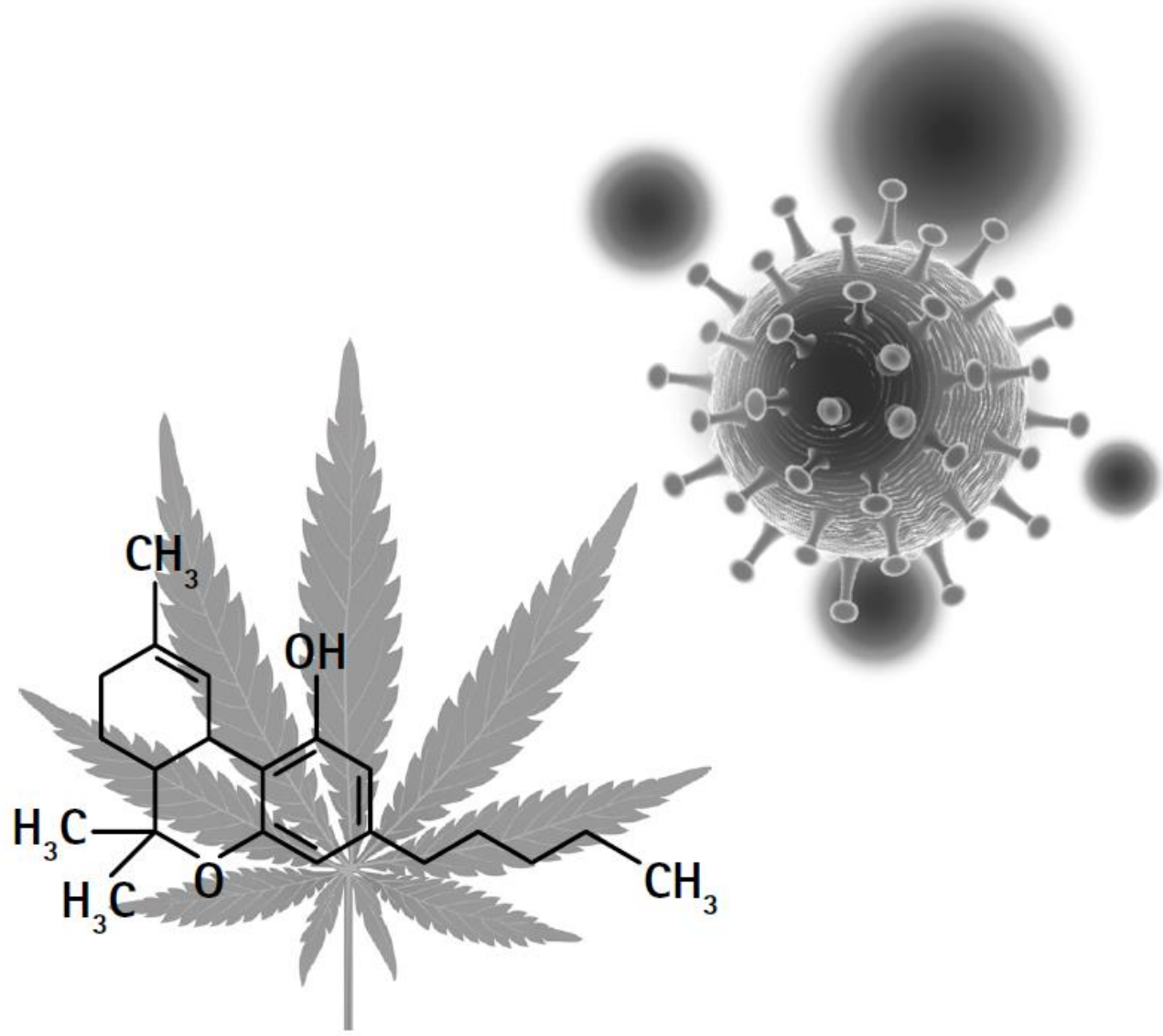
Final Report

“Self-care of Patients with COVID-19 Using Cannabis”



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Starting points and problem statement

In March 2020, developments on the subject of the newly discovered virus COVID-19[1] became the focus of interest for all levels and in all areas of society here in Germany too. At that time, very little was known about the virus, either nationally or internationally, and there was also hardly any experience in relation to well-suited treatment options in the event that infection actually triggers illness. Amidst this crisis-driven feeling of helplessness, many initiatives arose from many sides with the aim of introducing observational studies and everyday experience into the search for solutions to these dilemmas. Attention also fell on cannabis and its use as a medicine. The scientific findings available on this subject at the time already indicated that targeted use of cannabis in association with COVID-19-related precautions, prevention, treatment and aftercare could yield promising results (cf. Excursus).

An "Interdisciplinary Cannabis Research Network" has been developed and managed at the Hochschule Merseburg for many years. This network brings together expertise on the subject of industrial hemp along with research into the medicinal use of cannabis. Thus, as part of a research project for many years we have been collecting and assessing a pool of case reports on patients who have, on their own initiative, integrated cannabis into the treatment of suffering and disease states (hereinafter referred to as "self-care"). This was the starting point for the idea of investigating the question as to whether persons who had been given a positive test result for COVID-19 or who had even developed symptoms of the disease after infection were using cannabis in a targeted manner to manage their situation and if so, what experience they gained with that.

In view of the fact that hardly any research funds were available at the time, the aim of this project could only be to initiate an exploratory study to follow up on the observational experiences of those affected. The question was whether the practical application of cannabis by those affected gave any indication that cannabis lent itself to use as an agent for prevention, treatment or aftercare in relation to COVID-19. We were interested to know if there was practical experience which could underpin the already existing pharmacological and infectiological studies on the subject of "Cannabis and infectious diseases" and in this way provide indications about what the search strategies should be in future, more sophisticated studies.

Method

An anonymous online survey was initiated making use of Lime Survey, the free online survey application. This application makes it possible to develop and publish online surveys without the need for programming knowledge and to record and evaluate their results in a database. Used as a tool in the Hochschule Merseburg, this online survey had to meet the standards of the applicable Data Protection guidelines, as checked by the Hochschule Merseburg Data Protection Officer, before it could go online.

The target group for this online survey were persons who had received a positive test for COVID-19 and who had either developed no symptoms or more or less severe symptoms of the disease and in this way had collected direct experience in relation to their own vulnerability to COVID-19 and who had resorted to cannabis as a medication in their need.

It could be assumed that this group would be hard to find. The probability that affected persons would expect a positive effect on the management of disease symptoms from using cannabis is likely to be greater where, even before the positive test result, there had already been experience with helpful types of application for cannabis as a medication - irrespective of whether this positive experience was gained in the course of official treatment or rather as an incidental finding while using cannabis from illegal sources and/or in the recreational sector.

Reaching this rather small target group was going to be one of the challenges of this study. Links to the online survey were put up on media which regularly feature cannabis and its various uses as a central topic, and cooperation was solicited. With their help, within two weeks it was possible to establish contact with 595 persons who had at least noticed this survey even though most of them did not answer the questions asked. This shows the great interest evoked by the survey.

The survey started in the peak phase of the pandemic-related measures on 1/4/2020 and was ended on 26/6/2020 after more than seven days had gone by since any further persons had worked on the survey. In

[1] The name of the newly discovered coronavirus was given the suffix 19, signalling that this new member of the long-known coronavirus family was first detected in 2019. The name SARS-Cov-2 only won through in public debate in April 2020. Here we will adhere to the original name because, first, it is easier to distinguish between an infection and an actual illness triggered by the virus using that name and secondly, since it is becoming increasingly clear epidemiologically that, in most cases, the illness does not have a highly dramatic course unless various pre-existing illnesses complicate the process of overcoming it.

all, 899 persons took note of the survey and 162 had filled out the total survey in full. Of those, only 77 persons also firmly outlined their established COVID-19 infection and/or illness status. This result is quite remarkable in view of the fact that a rather small target group was expected.

Online surveys which cannot address their target group directly (e.g. by means of mailing lists, newsletters or other network structures) not only have difficulties reaching their target group. It also becomes a challenge to motivate those reached to take the time to fill out the survey carefully and to the end. Practice has shown that restricting the time required to fill out an online survey to 15 minutes is valuable.[2] This then poses the challenge of needing to find a balance between the greatest possible knowledge gain and a drop in willingness to participate. The basic concept for this study - that it should also be possible to work on it using a smartphone - also further limited the data collection possibilities since the following rule applies: “the smaller the screen, the shorter the survey should be” (cf. Excursus)

In this light, the policy decision was made to focus only on positive experiences in the use of cannabis to cope with positive COVID-19 test results and/or symptoms of the disease triggered by the infection and not to follow up on negative experiences. in a decisive manner. Eleven indicator sets, developed for the online survey, were used to provide limits (an average participant processed two to three questions per minute). Comments and explanations were repeatedly requested in the online survey to accommodate active participation. The intention was that a foundation of quantitatively assessable data could be collected in this way which would also, in the most favourable case, be supported qualitatively by the corresponding statements[3](cf. Appendix: Questionnaire).

The fact that, in Germany, recourse to cannabis as medication is only permitted to a few patients as part of their regular treatment placed great demands on the comprehensive confidentiality of this online survey. This was the only way to establish willingness to participate. In order to maximally protect the privacy of participants, the survey we created was economical on data, waiving plausibility and veracity checks on the statements which were input.

The findings presented here vindicate this acceptance of forgoing some data collection and the limits this imposed on analysis.

[2] cf. Rogator: How long should an online survey be?. In: Erfolgreiche Online-Forschung [Successful online research], https://www.rogator.de/lang-online-fragebogen/ last accessed 08/07/2020

[3] More than 600 comments were left in this survey; the majority of these were brief but some also contained detailed case histories and thus vividly underpinned the observational experience.

On the study procedure

The exploratory study was initially set up as a repeated online survey, i.e. a follow-on data collections was planned for the completed entry survey. It was intended that this would cast further, more detailed light on the management of actually experienced disease. However this follow-on investigation was also abandoned due to the (predictably) too small cases numbers.

An opening text at the beginning of the online survey outlined the reference and goal of the survey:

"Due to being highly infectious, the new pathogen - COVID-19– poses a danger to everyone. To date, hardly any treatments are known that can alleviate the severity of the disease, shorten its course, support the healing process or slow down its progression. Therefore, some patients are choosing to use cannabis in their self-care. Evidence of the therapeutic effects of cannabis (e.g. the anti-inflammatory, antibiotic, antispasmodic, bronchodilator-like and sedative actions) is accumulating, indicating that recourse to cannabis, especially vaporised inhalation of cannabis flowers could certainly be an option for contributing to symptom alleviation or healing of the illness. But adverse effects with regards to lung function such as airway inflammation, symptoms of bronchitis, increased airway resistance and lung hyperinflation are also reported. It is unclear what these depend on. The aim of this survey is to collect your experience as a COVID-19 patient who has used cannabis in self-care in a more or less targeted fashion to manage your own health situation with either positive or negative effects."

Another text block went into more detail about who could take part in this survey and which data protection principles were applicable. In addition, the participants were notified that processing the survey would take about five minutes and that the data would be secured via anonymous data storage without the option of IP address tracing:

"COVID-19 patients are defined for the purpose of this study as those who have tested positive and have either not developed any symptoms or show symptoms of any degree (from mild to severe). Should you belong to this group, we are asking you to complete this survey to the best of your knowledge so that your experience is made available.

Your information will only be processed in this study and will not be disclosed to third parties. The raw data will be deleted after analysis. The analysis is completely anonymous. We assure you that at no point will conclusions be drawn as to your person. It will take you only about 5 minutes to complete the questionnaire.

Information about the further course of your infection over time is also of interest in this study. In four weeks, you will be invited again and another survey questionnaire will be posted to collect and evaluate your experience since the first survey questionnaire. So it would be very helpful if you would also send us this information via the questionnaire which will be then available. We know that this is a lot to ask. Only through your efforts will it be possible for us to support each other by sharing and analysing our experiences in overcoming the infection. So, we look forward to hearing back from you in a month."

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Evaluation strategies

The online survey is indebted to the concept of Citizen Science, i.e. the everyday experience and observation studies of those affected are not just given special appreciation when collecting and systematising of the empirical findings; they, with their expertise, are included in the assessment and interpretation of the data.

"Thank you very much for your cooperation! The study aims at collecting rapidly a significant amount of information to lead to valid results. Please feel free to distribute the study link to other patients you know. Please remember to report back to us in four weeks on how you have experienced the further course of your infection as a result of self-care and treatment using cannabis. With your experience, the hypothesis that cannabis can help patients to care for their COVID-19 can be scientifically tested. The results of this hypothesis testing will provide helpful advice to all patients now fighting to regain their health in this pandemic. If you are interested in the results of this little survey: We will regularly present them on the following link: http://freies-ganja.de/ GET WELL SOON!*"*

In line with Citizens Science principles, a first interim analysis of the online survey was published on the website http://freies-ganja.de and opened to discussion on 14/4/2020. Unfortunately, this opportunity was not really availed of - only a few comments which mainly declared more extensive uses for cannabis as a medication for other states of disease and suffering.

The analytical concept for the online survey is characterised by only collecting so-called "soft data" (cf. Appendix: Questionnaire). This means that (1) representative random samples were not used, (2) survey participant information and the veracity of the statements made were not checked using cross-questions/logical conclusions and (3) assessment of survey data is very dependent on the person and/or situation of the participant and thus on the individual's judgement and is therefore open to a number of interpretations. It is precisely for this reason that the survey was created with the Citizens Science concept.

Since the strategy used for statistical analysis must correspond to this data quality, these restrictions in the quality of the data collected also qualify the possibilities of the analytical instrument. It is limited to descriptive statistics.

However, the numerous individual comments left by participants provide an opportunity to make the statistical analysis more explicitly transparent and alive using the qualitative element of this study.

The empirical data of the online survey

On participation in the online survey: between everything and nothing at all

By 14/4 2020, that is, after fourteen days, 595 persons had taken part in the survey but only 96 persons had also answered all the questions to the end. This pattern continued until the end of the survey: by the time it was concluded on 26/6/2020, 899 persons had taken note of this survey, i.e. opened the link at least. Of those, 162 persons answered all questions completely; only 77 persons also disclosed their status in relation to COVID-19, whereas the remaining 85 persons explicitly indicated at this point that they did not wish to answer this question.

The online survey primarily reached persons from Germany: 32% of all participants came from Germany, 3% from Austria and only isolated persons indicated other countries of origin (including: 1 x Columbia, 1 x France, 2 x Italy, 4 x Switzerland). Unfortunately, 66% left no information on this.

The pattern of those 737 persons who opened the link but did not fully complete the survey is very varied:

» 57 % worked their way through the survey until questions 3-5 and thus to the questions which asked for a statement on patient status and COVID-19-relevant preexisting illnesses. They then discontinued further input. For this group, it can be assumed that they did not notice until just this point in the online survey that they could not participate because did not have the required expertise.

» A larger (12%) group can be discerned who discontinued answering the online survey when there were specific queries on self-care with cannabis and when they were asked, among other things, to disclose which type of cannabis was used and from which source. Here it must be assumed that insufficient trust had been created in the anonymity of the study so that fears either about lack of reliable data protection, or about criminal proceedings, stigmatisation or similar reasons could have been responsible for discontinuing participation in the study.

» Generally 7 % clicked all the way through the complete survey but did not fill it in at any place. The assumption can be made that this group had a content-related interest in the topic/survey without actually having expertise in the form of being affected themselves.

This general picture for incomplete processing was already recognisable in the first interim analysis. This was therefore addressed and queried on the internet portal where the first interim results were opened to discussion. Unfortunately, no explanatory answered were entered in response the queries on this subject. In the later overall analysis, one comment explained: *"You forgot to limit the survey to COVID-19 infected persons, no checks...nothing, any troll can and will take part."* This (single) piece of evidence at least underlines that, despite the detailed explanations at the beginning of the survey, it apparently did not succeed in excluding erroneous participation from interested parties.

In the later part of this report, only those statements will be analysed which were made by persons who completely worked through the online survey i.e. actually answered all questions, even with "No Answer", where appropriate. This group will hereinafter be referred to as the "Participants" and is comprised of 162 persons.

The participants

Age

Those who completely processed the survey and also left information on their ages (142 persons) were on average 34.7 years old (standard deviation 12.2), the oldest person was 69 and the youngest 24 years old. Although there were participants representing every age cohort, this was a rather young group whose lower quantile was 24 and upper quantile was 41.2 years (cf. Appendix: Summary A1).

Hence, the study provides information on rather a young group of participants which was predominantly male - only 13% of the participants were women, 1% described themselves as diverse.

COVID-19 status

Unfortunately, 52.5% of all participants did not describe their status in relation to COVID-19 infection, most also did not make any disclosure on that. Some pointed out that they had not been tested despite having typical symptoms of the disease, many commented that they noticed symptoms of the disease but followed the general advice and did not visit any test site or medical practice, yet others that they had dealt with the test and/or an illness "on their own initiative" for fear of the drastic regulative isolation measures (12%). This is understandable as positive test results have considerable consequences in professional, support-related and not least in a financial context both for the person affected and for those in their personal sphere.

From those who described their COVID-19 infection status, at the time of the survey, 9% assessed themselves as positively tested but asymptomatic, 27% as ill with mild symptoms (sore throat, a little weak), 10.5% as positively tested with moderate symptoms of the disease (high temperature, cough, bedridden); only one person was treated as an inpatient and then in intensive care. In this respect, the survey results provide information on a group which as a whole had mild symptoms of the disease (cf. Appendix: Summary A3).

Pre-existing illnesses

11% gave no answer to the question on relevant pre-existing illnesses. Those participants who answered were on the whole a healthy group with 58% without severe pre-existing illnesses. Asthma (10%), autoimmune disorders (8%), pulmonary diseases (8%) and cardiovascular diseases (7%) predominated among the prior illnesses which had been experienced at any time in their lives (cf. Appendix: Summary A5a).

38% of participants did not answer the question on continuing need for treatment of a preexisting illness. For those who mentioned current need for treatment, 37% indicated somatic pre-existing illnesses which could have a relevance during COVID-19 infection: autoimmune disorders (6%), asthma (5.5%) cardiovascular diseases (5%, most of which were hypertension but also heart attack) and pulmonary diseases (4% mostly bronchial illnesses but also including 1.8%, persons with COPD) (cf. Appendix: Summary A5b). The 3% of participants who had more than three serious and also COVID-19 relevant pre-existing illnesses (hypertension, aneurysm, diabetes, arrhythmias, loss of a kidney) must clearly be included in a risk group for serious disease progression.

Surprisingly, 8% of participants indicated psychiatric disorders (including depression, ADHD, PTSD and phobias) and (in part) chronic migraine in the requested comments and explanations on pre-existing illnesses. In some cases, it was indicated that these mental impairments required further treatment. What is surprising in these empirical results is that these clinical pictures were not surveyed with the indicators used but were explicitly mentioned by participants. This made it clear that, from the perspective of those affected, there were relationships between the mental disturbances/preexisting illnesses they had mentioned and coping with a positive test result or illness with COVID-19. In this way, the participants addressed the serious secondary effects and indirect repercussions for mental health which are associated with COVID-19 in relation to a positive result and the fear of disease. Many left more extensive statements, especially specific information on the helpful effect of self-medication with cannabis and how they personally perceived these relationships (cf. Appendix: Comments).

Previous experience with cannabis

The survey did not ask any explicit questions about previous experience with cannabis. We intentionally refrained from requiring the participants to make this disclosure in view of the fact that the image of cannabis in society continues to be characterised by stigmatising imputations as a “stoner” drug and a “drug for addicts”. However, the comments left in the survey by the participants permit us to conclude that at least 31.3% had already used cannabis as medication to manage certain states of suffering before the COVID-19 crisis, independent from official medical treatment. But there was also, in most cases, experience with the recreational consumption of cannabis. No participant described directly resorting to cannabis to obtain alleviation in coping with a positive test result or symptoms of illness having had no previous experience.

It seems understandable that previous experience is needed in order to consider the capabilities of cannabis as medicine in a personal emergency or in a specific illness situation.

Cannabis treatment attempts

Selection of variety

Only 14.8% of participants belonged to the group of officially permitted cannabis patients. Most of these used Bedrocan® and thus medical cannabis flowers.

Most of the participants must have accessed illegal cannabis for their treatment attempts. This group also includes officially permitted patients who supplement their prescribed cannabis needs with purchases on the black market. Aside from one exception, the participants did not make any disclosure on that: *“It is only very rarely that you know the THC-content, unless you get it from a pharmacist, which in turn is very unusual, even for patients with special exemptions.”* Here one can see the familiar situation, that the high pharmacist prices create great obstacles to covering a necessarily larger need using these legal sources.

An overall view makes it clear that 41.3% of participants used their own homegrown cannabis flowers for self-care, 83.9% purchased cannabis flowers over the black market and 22.2% resorted to hashish, also purchased on the black market. 18.5% of participants also used pure CBD for their treatment - the sources for this were not mentioned in the study (cf. Appendix: Summary A6).

The high level of black market purchasing of cannabis as medicine had the consequence that many participants could not provide an adequate description of the cannabis they used and also they expressly indicated this drawback: *“It’s also important to record that I...had to buy myself the marijuana on the street...So I have vaporised marijuana of unknown origin and THC content, and buffered or supplemented the effect with a legal CBD oil.”*

For the most part, participants either gave no information or cited the usual “scene” names (including Blueberry Genetic, Silver Haze, Kush, Shiva-Skunk, Critical). This made it apparent that cannabis flowers for treatment were for the most part purchased on the illegal market.

The participants also pointed out that, when purchasing illegally, it is not always possible to select between different pharmacological profiles and to employ them in a targeted manner. Nonetheless most of them provided information implying that there was no clear preference in relation to the distinction between flowers with high Sativa or high Indica content, either when home-growing or with black market purchases. Hence it is surprising that both kinds were used by the participants in self-care for a positive result and/or COVID-19 illness. So, if anything, no distinction is made as to whether a positive effect is ascribed to one or the other pharmacological profile. Only one person mentioned differences between the two sorts and emphasised “...*only with Indicas or possibly low-THC Sativas*...”

Hashish was used as a medicine for managing a COVID-19 infection by 22.2% of participants, where there are several notes indicating: *"Grass is better"* which could possibly refer not only to the available types/pharmacological profiles but also to the forms of use. Unfortunately, this was not given in more detail.

Still, 18.5% pointed out that they used CBD flowers or mixed their THC-containing flowers with CBD oils. Hence, it can be assumed that there was some expertise among the participants where they at least knew the difference between the THC and CBD cannabinoids and intentionally made use of their different effects. Anti-inflammatory, antidepressive, anxiolytic, sedative and analgesic effects have been well established for CBD by this point. This is probably the reason why CBD use is primarily justified by the objective of becoming calmer, having less fear and being better able to eat.

Cannabis taken as capsules was mentioned and discussed in only one case "*...I found Sativex to be strongly bronchodilatory. Unfortunately, I often have problems with oral mucous membrane here. So I made myself some lozenges from THC extract...I make lozenges myself with caramel, chamomile extract and the THC extracts. These stimulate the salivary glands and THC also has a rapid effect on other symptoms via the oral mucous membranes."*

Dosage

The above-described difficulties in being able to make reliable statements on the active agent content of black market products resulted in 61% of participants providing no information on the subject.

» One group was noticeable, 25 % of all participants who dosed themselves with 1-5 cannabis flowers. Only 6.6% dosed with a quantity of 6-10 cannabis flowers and 3% with up to 20 cannabis flowers (cf. Appendix: Summary A8). One comment explained it in this way: *"...especially with the higher THC proportion, it helped against the gross mucous congestion that you had otherwise (dry chesty cough). Diarrhoea with nausea occurred in parallel; it also helped with this. When I had an attack of shortness of breath and was just about to call the medical emergency services, just before, I took something orally and that relieved the breathlessness and panic so that I was able to sleep. But of course you shouldn't take too much, since it raises the pulse and the shortness of breath can even get worse. Only moderate amounts are helpful. And I wouldn't smoke it either, more likely take it orally or vaporise it..."*

» 68 % of participants were unable to answer the question about the mg of THC in the flowers they had consumed. 3% stated that they had taken a dose of about 100 mg THC which would be an extremely high quantity and more probably indicates an incorrect estimate. The statements of those who estimated that they had taken 1 - 5 mg (11 % of participants) or 10 - 20 mg THC (6.7 % of participants) were more realistic (cf. Appendix: Summary A8).

» Only 11 people answered on the quantities used and active substance content of hashish, three of whom reported a quantity of 1 - 4 mg THC, three people each reported 10 - 16 mg and 25 mg consumed THC; 2 persons referred to very high quantities with 85 mg and 100 mg THC. They remained the exception among the participants and justified this with: *"The higher the quality...the better the relief."*

» Only 6 participants reported that they only used CBD drops and proceeded with very small doses of 1 - 3 drops (3 persons), 6 drops (2 persons) and 10 drops (1 person). The 4 participants who took CBD as pump-strokes used two (2 persons), four or eight pumps strokes for their dosages.

» Only 5 participants reported having added 2 - 3 CBD drops to their THC-containing cannabis flowers.

It is apparent that the reported consumption quantities are rather lower, both in relation to the number of cannabis flowers used and in relation to the quantity of mg THC used in a medical application, and thus clearly differ from recreation consumption. In the comments it was also often emphasised that the participants had proceeded cautiously, trying out special mixtures which helped them to manage their illness: *(1) "Every day over the period of the illness, I mixed up a mixture of 1 - 2 flowers with 3 - 5 g hash, kneaded together with tobacco. Enough to yield altogether 7 - 8 bong heads and then distributed them over the whole day." (2) "In my opinion, the combination of THC and CBD is the best tolerated and most effective." (3) "In the form of self-made drops (10% resin in 96 % C_2H_5OH) or vaporised. According to the seed supplier, the plant contained up to 20% CBD and less than 1 % THC."*

The significance which the participants give to CBD is remarkable. In many cases this was used as a single substance but also as a supplement to THC-containing flowers. The explanatory comments lead one to conclude that recourse to CBD was clearly related to its potential positive effects in coping both with a positive COVID-19 test and when symptoms of the disease occur. It would be interesting to know if these hopes for alleviation and support for healing arose solely from theoretical discussion of the CBD issue or from direct personal experience, gained when dealing with other symptoms.
One comment at least suggests that the participant had gained vital everyday experience of the considerable

alleviation which recourse to CBD can provide in the management of a difficult-to-suppress cough urge and severe coughing attacks: *"...about 4 weeks ago I suddenly had a very dry cough which continued for two weeks, became worse and sometimes resulted in shortness of breath...so, I vaporised CBD flowers and as a result the cough improved greatly. After 2 days I dropped the CBD again and continued to use my normal medication (THC). I had hardly stopped when my condition worsened, the cough became extreme again. I started to vaporise CBD flowers again and my condition improved within about 5 days so that the cough and shortness of breath almost disappeared. The THC flowers changed NOTHING in my condition, but CBD did! (CBD flowers with approx. 18 %)..."* The use of 18 % CBD flowers mentioned here emphasises that the cough relief effect is apparently more associated with higher doses of CBD.

Forms of consumption

THC-containing cannabis flowers were vaporised by 41 % of participants, smoked pure by 42 % and mixed with tobacco by 50 %; 22 % took cannabis in the form of oil and 7 % in drops, especially if they used cannabis on its own or as a supplement to flowers (cf. Appendix: Summary A7). One comment explained: *"THC Indica Dominant/Hybrid cannabis extracts vaporised and taken orally in case of breathing problems"*.

The variety of answers submitted suggest that no specific type of application had turned out to be especially reliable. This is especially jarring as it is known that respiratory inflammations, bronchitis symptoms, increased airways resistance and pulmonary hyperinflation can be triggered, especially in connection with mixtures of cannabis and tobacco. With this mode of action, smoking a mixture of cannabis and tobacco would at first appear to conflict with its use in managing symptoms of COVID-19 disease. However, the comments in connection with managing the urge to cough and coughing (see below) in particular explain that bringing the cannabinoids directly into contact with the irritated mucous membranes can generate a very rapidly occurring positive effect. Apparently the precondition for this however is the selection of a moderate amount in order not to generate the opposite effect with increased pulse and shortness of breath and that the gases breathed in be at lower temperatures in order not to trigger further mucosal irritation with the temperatures.

Intake intervals

A somewhat clear picture emerges for intake intervals: 20 % reported once daily use, 19 % took cannabis as medicine as needed. Still, 56 % of participants described taking cannabis several times a day (cf. Appendix: Summary A9).

» Those who described using *cannabis as needed*, described the following situation: pain (pain peaks, conditions of pain such as head and limb pain, muscular tension, migraine), mental tension (with nervous stress, nocturnal restlessness, anxiety, flashbacks), physical malaise (high temperature, diarrhoea) and problems with the upper respiratory tract (mucous congestion, urge to cough, shortness of breath with shivering attacks).

» Unfortunately, those participants who used cannabis *once daily* left very few comments (39 %): of those, most described that they only used cannabis in the evenings (24 %), "CBD in the morning and evening, cannabis flowers only evening" (3%) or "as soon as I felt a tickly cough" (3 %).

» Participants who took cannabis *several times a day* submitted a range of explanatory comments which recorded very different experiences: many participants (29 %) indicated an interval of 3 - 4 hours between individual intakes, others (10 %) used intervals of more like 6 - 10 hours and yet others (5 %) had a "mornings and evenings" rhythm, finally some (5 %) referred to greater intensity for once every hour "depending on pain situation".

It is noticeable that the participants proceeded rather carefully, cautiously trying to find intake intervals which actually helped them in managing their states of suffering or illness. Highly frequent intake intervals were more the exception in this and were justified with reference to severe pain states. Overall it emerges that the respective reasons and hopes for relief/improvement exert a clear influence on how the dosage and intake times were selected in self-care, that is, that very subjective treatment concepts were developed on this.

In the information on intake intervals, indications are also found that CBD especially can be an effective medication in the treatment of severe urge to cough, coughing and congestion: *(1) "CBD drops 3 times a day 10 mg. Vaporiser: 3 – 5 mal times a day 40 –100 mg. These dosages were consumed approx. every 2 - 4 hours. The dosing was here almost only taken spread over a longer period (at least 30 minutes). This is due, on the one hand, to the very effective, form of consumption, which dissolves the active substance. But the vapour which increased the urge to cough also played its part." (2) "0.5 hours CBD per day via vaporiser".*

Experience in the use of cannabis to deal with a positive COVID-19 test and/or with initiated symptoms of the disease

The aim of this study (which was also communicated to the participants) was to find out whether it would reveal positive effects due to the use of cannabis on coping with a positive test result and/or symptoms of the disease caused by COVID-19 infection, which medical research and treatment could then link up with. Hence, using a specified indicator set, the study only asked after the effects of using cannabis as a medicine for which helpful influences could be possible on the dominant disease symptoms caused by this viral infection. Thus the intention was to further intensify the focus on the helpful experiences to be collated and, at the same time, to prevent participant reporting from expanding to cover experience gained in the management of other states of illness or suffering. Multiple answers were permitted for these indicator sets (cf. Appendix: Questionnaire).

This procedure proved to be appropriate in this survey: 91 % of participants were able to describe positive experience with the indicator set. In many cases, these were further explained in the comments.

It was possible to enter no experience or negative experience in the comments. This covers 0.8 % of the participants who expressly declared that cannabis had not given any help in this situation.

Anxiolytic

Of those who benefited from self-care, the majority related the effects providing support in dealing with a positive test result and/or managing COVID-19 illness to possible anxiolytic effects of cannabis: sleeping better (67 %), less apprehensiveness/restlessness/anxiety (53 %) and limiting the feeling of being unwell (48 %) (cf. Appendix: Summary A10). This was often the general tenor of comments which highlights the fact that anxiolytic effects were not just restricted to individual symptoms but rather were described in several dimensions. This underlines the great value of this direction of action for participants in dealing with the test and/or illness.

These statements were reinforced by various references to cannabis being helpful in dealing with anxiety disorders and previously unknown depressive moods and also making it easier to cope with the imposed isolation: *(1)...During his COVID illness, my husband had a depressive episode which affected him for three days. For me, the depressive episode lasted just one day and was at most half as bad. Neither of us has a history of depressive illness..." (2)...I have no confirmation but I have seen how people have suffered from isolation... The fear and stress about this illness is immensely great. For me, this was alleviated by taking oily extract..." (4) Reduced nervousness, coped better with isolation, general condition (mood) improved."*

In view of the media treatment of the pandemic, which, at least in the first weeks, quite apparently relied on the disciplining effect of fear and terror, it is understandable that those affected searched for strategies for coping with it and found these in cannabis: *(1) "I believe that I would have gotten through this without great problems even without cannabis. However it took away all agitation and had a thoroughly positive effect on my own condition. I am admittedly a regular cannabis patient but then only need a small dose in the evenings. During the illness, I greatly raised the dose, especially of black market extract, and because of that I was able to sleep at night." (2) "...In corona times, cannabis helped me to stay calm and relaxed in all respects. It takes away my mental pain and gives me the strength to function, even physically, without pain: nausea, headache, anxiety, worries, depression etc..."*

In the participant comments, there are also references to psychosocial effects associated with cannabis consumption and which clearly made it easier for the participants to cope with their restricted living conditions: *(1) "Less conflict in the family because you feel calmer."*

Influence on symptoms of the disease

Breathing

The fact that participants also indicated that their breathing was eased (35 %), shortness of breath (33 %) and nausea (27 %) alleviated, breathing experienced as less painful (18 %) and also that fever reduction was associated with cannabis consumption (16 %) could also be assessed as closely linked to the anxiolytic effect (cf. Appendix: Summary A10). To what extent these effects are based on demonstrable organic associations though they can at any rate be understood to be psychosomatic effects must remain an open question at this point. However, the high regard these registered effects on alleviation and healing are held in is unmistakeable.

Urge to cough and coughing

33 % of participant pointed out that cannabis can in particular soothe the constraining urge to cough. However this rapidly occurring effect appears to be linked with vaporising or smoking: *(1) "Only vaporising helped me with the urge to cough and shortness of breath, since I normally prefer taking cannabis flowers orally." (2) "Taking THC as a tincture or in food is to be recommended." But in the end I noticed that vaping decreased the tickly cough." (3) "I had no appreciable breathing problems during the illness - despite continued regular (exclusive) inhalation with Volcano and Mighty Medic (but only up to max. ~190° C instead of the normal up to 210° C, since over 190° C acted as a strong cough irritant whereas below ~190° C had more of an easing effect on breathing)."*

As a further effect in association with coughing attacks, participants described that it was easier to cough up mucous and in this way the feeling (which was also calming/anxiolytic) of getting more air was created: *(1) ...had the feeling that the mucous loosened and I was getting more air..." (2) "... tobacco and smoking pretty problematic. But the shortness of breath is better because of the calming effect - psychologically very helpful." (3) "...it is really a very good protection and should be used as a medication for corona to help the patient, especially when inhaling, a very good easing of breathing in the case of lung inflammations. The sooner you start the better." (4) "...for 4 weeks I had serious flu with cough, shortness of breath and gastrointestinal symptoms, 14 days of high temperature. ...Because of diarrhoea I took small amounts of cannabis orally. It helped me sleep through, against diarrhoea and hence weakness and against congestion; I was able to cough it out better. After three weeks I suddenly got shivering attacks and shortness of breath. It was as if the air wouldn't come into my lungs any more and I was very short of breath. I quickly took a small amount of cannabis and lay on my side. After a short while the mucous loosened. Then, there was the feeling I was getting air into my bronchi again, I could sleep, next morning I had to cough it out for an hour. Since then it's been looking up. I would never take too much cannabis with shortness of breath since it can intensify shortness of breath, only small amounts can do something. Since I cannot tolerate antibiotics, I rely on alternative means, and also take other measures like cough teas, inhaling, rubs and eating herbs as supplements. Cannabis is said to expand the bronchi. It seemed to me it saved me from a hospital stay."*

Pain management

The participant comments frequently mentioned that cannabis was able to alleviate or even end the strong headache and limb pain associated with the illness: *(1) "Cannabis medication only again after being bedridden. Mostly against pain which was intensified by the illness. Sill had limb pain even after 10 days."*

This raises the question of the extent to which these positive effects in relation to pain management could be improved on further if cannabis was not smoked but rather taken orally. After all some of the participants mentioned in their comments that oral application is better suited to self-care with such an application: *(1) "Also to be recommended as a tea in the case of COVID." (2) "Not recommended with tobacco. Digestive intake probably makes more sense to get more from it medically."*

Promotion of appetite, general well-being, and sleep

Several participants referred in their comments to the appetite-increasing effect of cannabis which also promoted healing: *(1) "Helped against diarrhoea also and against loss of appetite/weight loss - it was the saviour."* (2) *Increased appetite".*

Similar remarks also referred to the experience of having slept better with cannabis and in this way being better able to confront the challenges of the illness: *(1) "It was possible to sleep through here without being constantly awake." (2) Helped me to gather my strength, also helped against pain."*

In the comments, the overall effects were encapsulated in a significant improvement in general health: *(1) General malaise considerably alleviated." (2) "More relaxed" (3) "Better sense of wellbeing"* - effects which can impart energy and optimism in coping with illness.

No effect

Two participants observed in their comments that cannabis had not helped them to cope with the symptoms of a COVID-19 illness. Another participating person also commented:
"Aside from the fact that the survey is missing any potential NEGATIVE consequences for the illness progression, the option is not even offered of stating "did not help." This, at first glance apparently grave criticism of the study procedure (resulting from the focus of the survey) (cf. Method) is qualified by the following empirical findings: Only a vanishing small number of participants (0.8%) had referred to no positive effect from their self-care, almost all participants input in the survey their experience which was perceived positively in very different dimensions.

Theories of healing, narratives, interpretations, and experience rationales

The online survey ended with a request for subjects to give further explanations and outline experiences which the participants had gained from their self-care with cannabis. Even more detailed insights can be deduced from these statements regarding the framework conditions under which cannabis has proven to be a possible option for coping with the challenges to health posed by this virus.

In the summarising comments, it emerges that very particular hopes for alleviation and healing were linked with recourse to cannabis. To some extent, these theories of healing, narratives and interpretations are of a very general nature:

» In the first place, they relate to the already existing scientific evidence: *"I feel that the progression of the illness was attenuated and noticeably shortened, as with the recent viral and bacterial infections, presumably due to the antiviral and ant-inflammatory effect."*

» But, secondly, they are also fed from quite general hopes and subjective desires: *(1) "...just simply the hope for the ability to defend against or combat any illness that might occur. I haven't become ill with an infection in the last decades." (2) "Cannabis protects against viruses/bacteria, maybe it will protect against COVID-19." (3)...was treated with oxycodone for years, ended the treatment since I could no longer bear the side-effects...so I am full of pain...fled to a farm and there I was helped. I would like to add that the farmer family also inhaled marijuana oil in March and all have stayed health until now. Although all were infectious (sneezing coughing) but the marijuana oil helped quickly. The high temperature was gone after 3 days and the coughing and the sneezing too. Cannabis honey helped the children."*

» Thirdly, some participants transferred already existing positive experiences with cannabis as medicine to coping with COVID-19: *(1) "I prefer cannabis to synthetic painkillers like ibuprofen and paracetamol. The anti-inflammatory effect in particular is significantly stronger and entails fewer side effects." (2) "But the most important thing is, and I am more than proud of this: cannabis helped me to come down from my ... high-dosage antidepressive medication! My medicine for everything."*

» Only one single comment was based on traditional information whose source remains unclear: *"This is the way our ancestors did it, as you can read in old sacred texts. It helps against all complaints but only if you build up a reasonable drug level..."*

As also in relation to other disease symptoms and their treatment (e.g. psycho-oncology), an important role in prevention and disease management can at least be attributed to these subjective theories of healing and narratives even if it is in the sense of placebo-related effects like suggestion/expectations and conditioning.

In addition to general theories of healing, experience rationales were also described which related to the specific illness event experienced. They described how self-care could be able to give a direct push-start and/or support to the illness management process.

» This includes clear effects in the alleviation of troublesome symptoms of the disease such as fever and pain:

(1)"...the fever arrived at the same time as night-time restlessness and stress. These symptoms were alleviated by THC consumption and I didn't feel as feverish. But it didn't have any effect on my actual temperature, I believe, but made it more bearable." (2) "I felt that the psychoactive effect of the THC "covered" the symptoms of the disease*, especially the headache." (3) "Overall, it simply made it better." (4) "...I'm convinced that cannabis flowers + 600 mg CBD oil at least make the symptoms much more bearable."*

» Cannabis self-care could have complemented phases in the progression of the illness in such a way that improvements which were eventuating were actually given a different dynamics or these could simply be chance findings which resulted from a temporal association without a causal relationship: *(1) "Cannabis dropped the high temperature within 2 hours and made the course very bearable. After 12 hours I was completely free of symptoms." (2) "The only symptoms I had were a slightly raised temperature, strong cough, moderate throat pain, moderate headaches; everything was immediately relieved and was completely gone after 3 days."*

» Thirdly, adhering to a self-care treatment which had already been practiced with other states of illness also appears to be a form of self-empowerment and morale boosting/ refuge taking in a situation where few helpful treatment methods are known*: (1) "I have been smoking for over 35 years, cannabis has never been as important as it was during my illness." (2) "All the symptoms of my chronic bowel disease disappeared due to cannabis consumption...Cannabis is a gift of the gods and not a drug."*

Concluding remarks

The study results presented here in no way have the quality of a clinical study which would permit reliable evidence to be presented on the usefulness of treatment in the event of a positive test and/or disease symptoms triggered by a COVID-19 illness. They do not even allow for testing of plausible alternative explanations.

Nonetheless, they provide credible indications that the use of cannabis can prove its value in treatment. These should be urgently pursued in further research. The focal points in this should be:

» A particularly striking feature of participant statements was how they described moderate administration of cannabis in the form of THC and/or BD-containing flower making it considerably easier to cope with of the urge to cough, coughing and congestion. This provides indications that direct effects on the mucous membranes of the upper respiratory tract (nasopharyngeal space) are more likely to be beneficial with this aim. For this reason, it was often pointed out that both vaporising and also smoking small quantities had a considerably greater effect than oral intake. At the same time, participants were aware that smoking could be a rather detrimental form of application. In this context, we should point out the interesting reference to the production of lozenges from THC or CBD-containing ingredients with which a direct effect on the upper mucous membranes is also possible and with which the known negative effects on mucous membranes, as in drying out, can be circumvented. After all, in countries where many years' experience has been gained in the medical use of cannabis (including California), there is a wide range of so-called eatables, that is, food with added cannabis which is suitable for treating oral and pharyngeal mucous membranes (including sweets and lollipops). An important conclusion of this online survey would be to follow up on these experiences in further studies.

» In a series of statements it emerges that an important role can also be assigned to cannabis as a medicine in coping with a positive test and/or symptoms of COVID-19 illness because, in addition to its effect of overlaying serious malaise in the form of fever, headache and aching limb, it has the capacity to cause a significant anxiolytic effect. In particular, in stages of illness where psychological consequences such as concerns and fears can initiate disastrous interactions with psychosomatic effects, cannabis medication appear to be an opportunity to interrupt such disastrous chains of effects to enable the calm and relaxation needed for the healing process. These findings confirm the results of a study of HIV-positive subjects and AIDS sufferers in 1997. In this study also, one great benefit from self-care already consisted in a psychological brightening which had greatly improved the quality of life of those affected and by this means had also brought about direct somatic gains because, for example, the seriously detrimental psychological and somatic effects of treatments can be considerably reduced or even stopped using psychotropic drugs[4].

» There are frequent mentions in the participant experiences that the signs of approaching upper respiratory tract illness (including sore throat, feeling of being unwell, the feeling of impending fever) can be thwarted by recourse to cannabis. These experiences confirm the already existing scientific findings on the protective factors in the form of antiviral, anti-bacterial and anti-inflammatory effects, collected from everyday experiences. To intensively follow up on this in medical research would also be a significant consequence from the results of this study.

» Finally, the special significance which is repeatedly ascribed to the use of CBD highlights the fact that this cannabinoid has the potential to become the basis of important biopharmaceuticals in future which could replace possibly invasive chemical medications with considerable side-effects (including stress on gastrointestinal tract, kidneys and liver).

Overall, the participant experiences we found indicate that the use of cannabis is able to trigger possibly interlinked and various directions of effect (analgesic, antispasmodic, decongestant, anxiolytic/sedative, appetite and sleep promoting) which have complex and synergistic effects. Thus, cannabis has not only a symptom management effect but can also promote or at least support healing processes in this way.

The results of the online survey highlight the special significance which can be given to an intensive scientific attention to medical research related to the use of cannabis as medicine. They virtually demand not only that the appropriate research should be permitted but that it should be directly encouraged and provided with the appropriate means.

[4] Barsch, G. (1997): On the medical use of cannabis -Results of a pilot study among HIV positives and men and women with AIDS. In: (Deutsche AIDS-Hilfe (1997): Cannabis als Medizin – Beiträge auf einer Fachtagung zu einem drängenden Thema [Cannabis as Medicine. Contributions at a Conference on an Urgent Issue]. AIDS-Forum DAH, Sonderband, Berlin

Acknowledgments

We would like to thank everyone who worked on our survey and in that way, made their experiences available to us. The often very detailed comments in the answers greatly facilitated better understanding of the interrelationships.

This serious collaboration in our study also contradicts the warnings given beforehand, that our questions would only encourage myths and raise expectations for healing which cannot be met. This committed participation highlights the fact that this survey made it possible to establish an important insight into how people help themselves with cannabis in the event of a COVID-19 positive test and/or even an infection caused by the virus without getting lost in expectations which are impossible to meet. We will therefore close with this quotation which encapsulates this wonderful attitude particularly well and disabuses everyone who do not credit “cannabis users/stoners” to make serious and target-oriented statements or who immediately discredit them, according to the principle that “they just want to have their fun”:

“It’s certainly not a cure but definitely has a supportive effect.”

Appendix: Indicators used in online questionnaire

Personal questions

1. Your age in years? _____ No answer ☐

2. What is your gender?

- Female ☐ (1)
- Male ☐ (2)
- Various ☐ (3)
- No answer ☐ (4)

The data will be statistically summarised and evaluated anonymously. So please do not mention any further personal information.

3. What is your patient status?

- Tested positive without any symptoms of the disease ☐ (1)
- Tested positive with mild symptoms of the disease (sore throat, a little weak) ☐ (2)
- Tested positive, with moderate symptoms of the disease (high temperature, cough, bedridden) ☐ (3)
- Tested positive, in-patient treatment ☐ (4)
- Tested positive, intensive medical care ☐ (5)

4. What country do you live in?

- Germany ☐ (1)
- Italy ☐ (2)
- France ☐ (3)
- Other country: _____ ☐ (4)

It would be nice if you could leave a comment _____

_____

5. Which illnesses have you had?	**-ever had in your lifetime**	**-currently requiring treatment**
• Cardiovascular disease	☐ (5)	☐ (6)
• Diabetes	☐ (7)	☐ (8)
• Kidney disease	☐ (9)	☐ (10)
• Asthma	☐ (11)	☐ (12)
• Lung disease	☐ (13)	☐ (14)
Which one? _____	☐ (15)	☐ (16)
• Autoimmune disease	☐ (17)	☐ (18)
• Liver disease	☐ (19)	☐ (20)
• Immunosuppression	☐ (21)	☐ (22)
• None	☐ (23)	☐ (24)

It would be nice if you could leave a comment _____

_____

Your own cannabis treatment attempts

6. Which varieties of cannabis did you use?

- Medical Cannabis Flowers (pharmacy/dispensary) ☐ (25)
- Which one? _____ ☐ (26)
- Cannabis flowers (own cultivation, black market) ☐ (27)
- Which one?
  high Sativa content (1) ☐
  high Indica content (2) ☐ (28)
- Hashish (black market) ☐ (29)
- Pure CBD ☐ (30)
  In which concentration? _____ ☐ (31)

It would be nice if you could leave a comment _____

_____

7. In which mode of administration have you used cannabis?

- Vaporize ☐ (32)
- Smoking ☐ (33)
- Smoking mixed with tobacco ☐ (34)
- Gel/Cream ☐ (35)
- Spray ☐ (36)
- Drops ☐ (37)
- Capsules ☐ (38)
- Oil ☐ (39)

B. What was the amount of cannabis that you used?

- Cannabis flowers _____ mg ____% THC ☐ (40)
- Hashish _____ mg ____% THC ☐ (41)
- + in addition to cannabis flowers, drops CBD____ units ☐ (42)
- Capsules ____ unit ____% THC ☐ (43)
- Drops CBD (____%) _____ units ☐ (44)
- Spray …….. Pump strokes (….% THC) ☐ (45)

9. How often did you treat or care for yourself with cannabis?

- Several times a day, at ____ hourly intervals ☐ (46)
- Once a day ☐ (47)
  Only as required ☐ (48)
  if:_____ ☐ (59)

It would be nice if you could leave a comment _____

_____

Effects which you were able to achieve immediately after using cannabis

10. I could care for myself because I experienced the following effects with the help of cannabis:

- Cough was soothed ☐ (50)
- Less shortness of breath ☐ (51)
- Less apprehensiveness/restlessness/anxiety ☐ (52)
- Breathing became less painful ☐ (53)
- Breathing became calmer ☐ (54)
- Fever was lowered ☐ (55)
- Slept more peacefully ☐ (56)
- Nausea alleviated ☐ (57)
- Feeling of being unwell limited/lessened ☐ (58)
- Something else _____ ☐ (59)

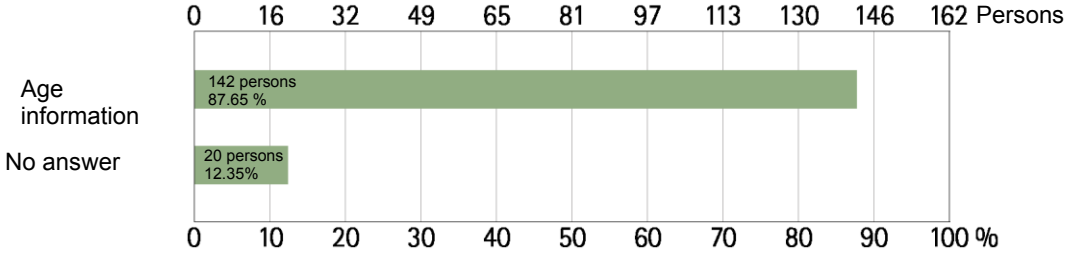
It would be nice if you could leave a comment _____

_____

If we have forgotten to ask something important: Here you have the opportunity to tell us about your special experiences when treating your COVID-19 infection with cannabis:

Appendix: Empirical findings of online survey after conclusion on 26. 06. 2020

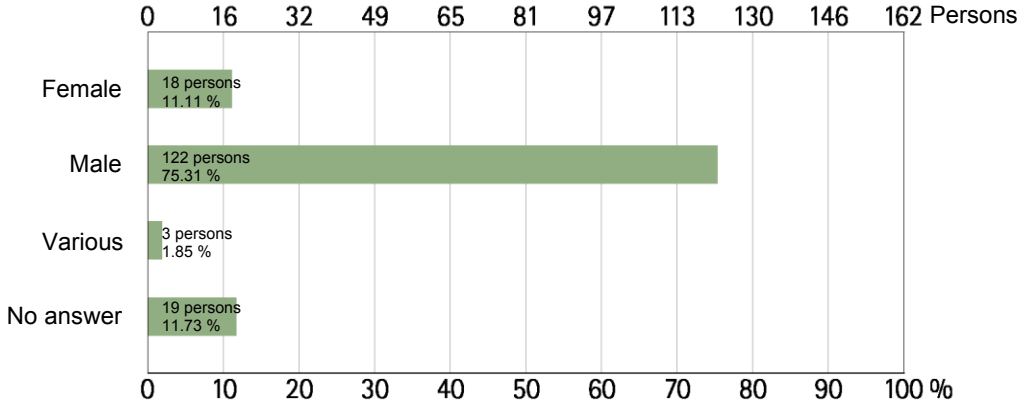
A1. Your age in years?



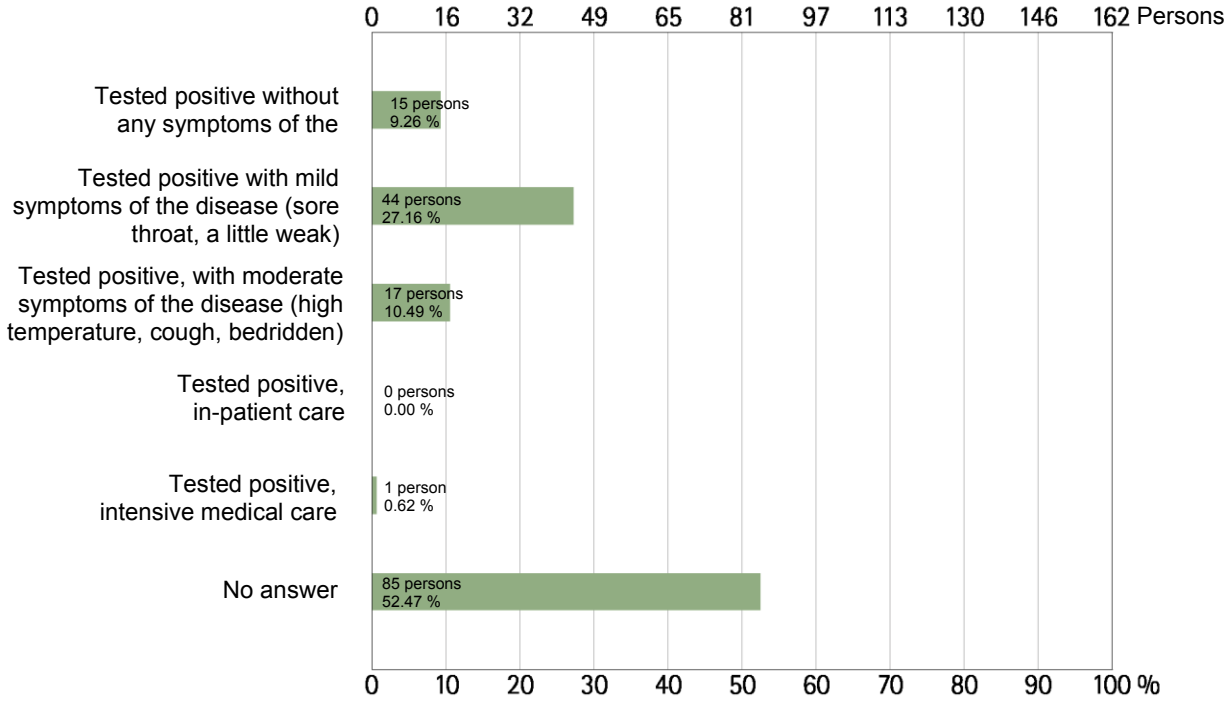
Calculation	Result
Number*	142.00
Total	4,931.00
Standard deviation	12.23
Average	34.73
Minimum	0.00
1st quartile (Q1 lower quartile)	24.00
2nd quartile (median quartile)	33.00
3rd quartile (Q3 upper quartile)	41.25
Maximum	69.00

* Persons who gave no information on their age are not considered in the calculation.

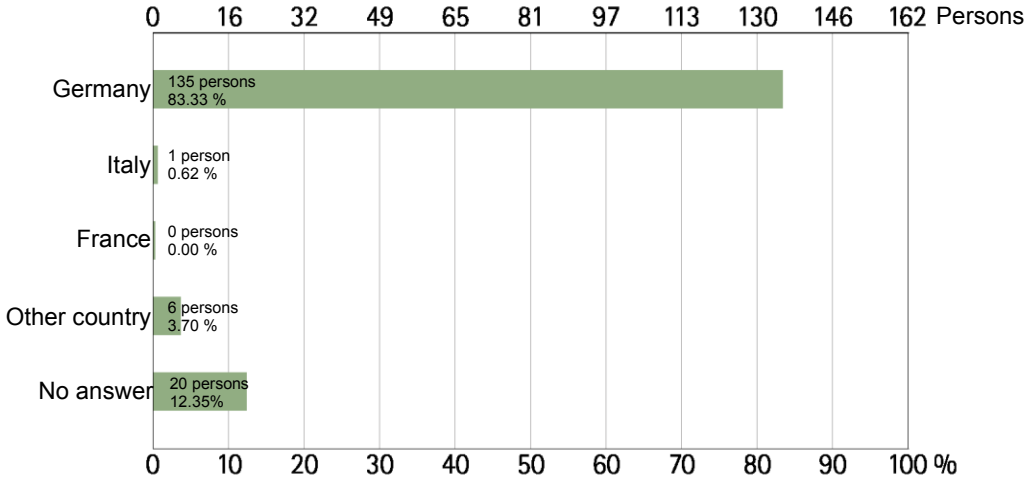
A2. What is your gender?



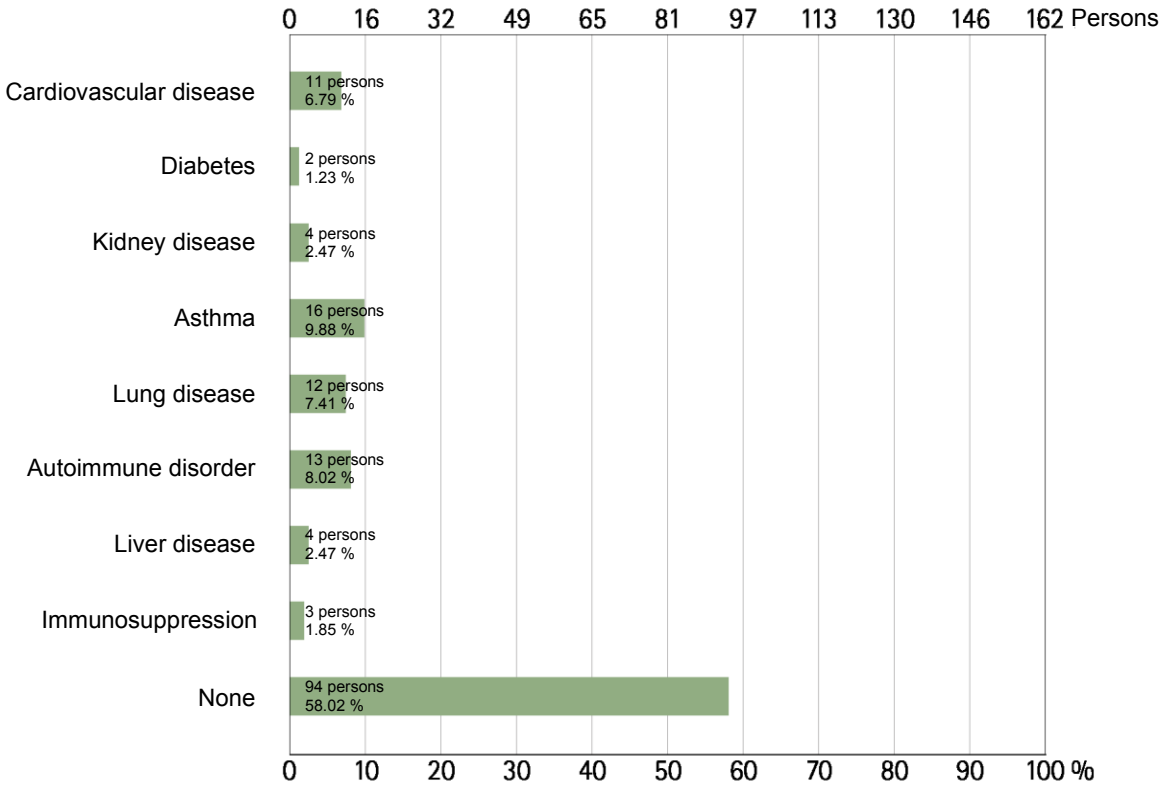
A3. What is your patient status?



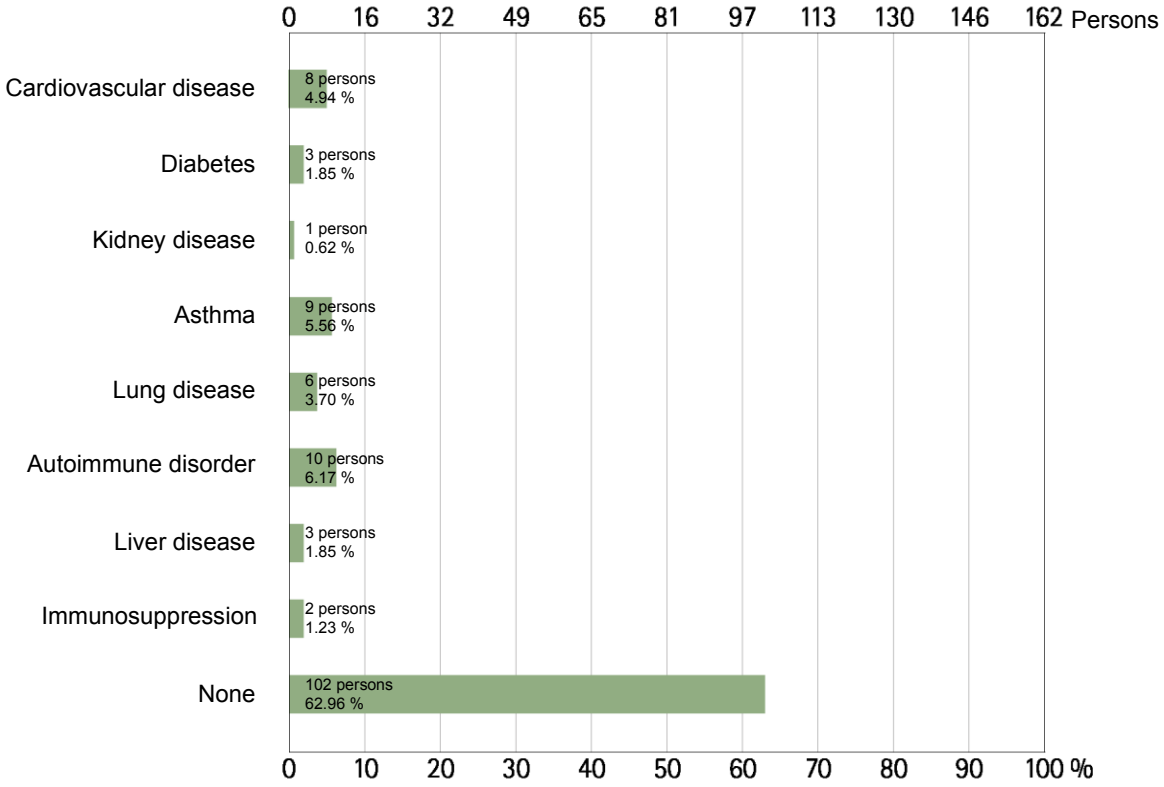
A4. What country do you live in?



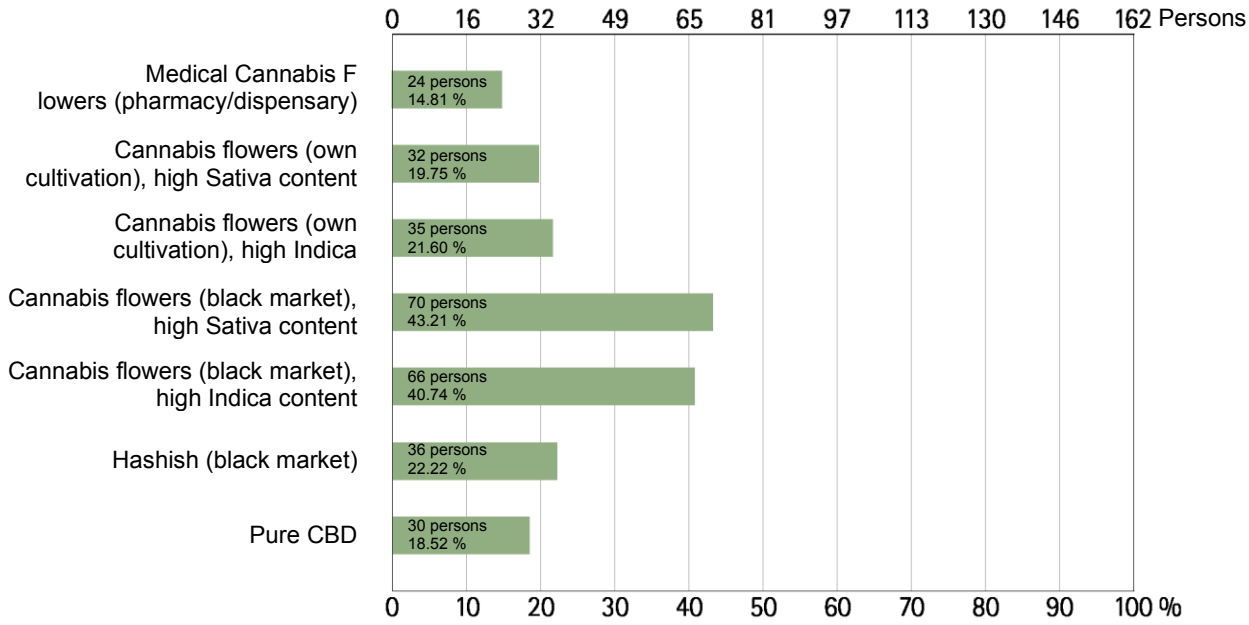
A5a. Which illnesses have you ever had in your life?



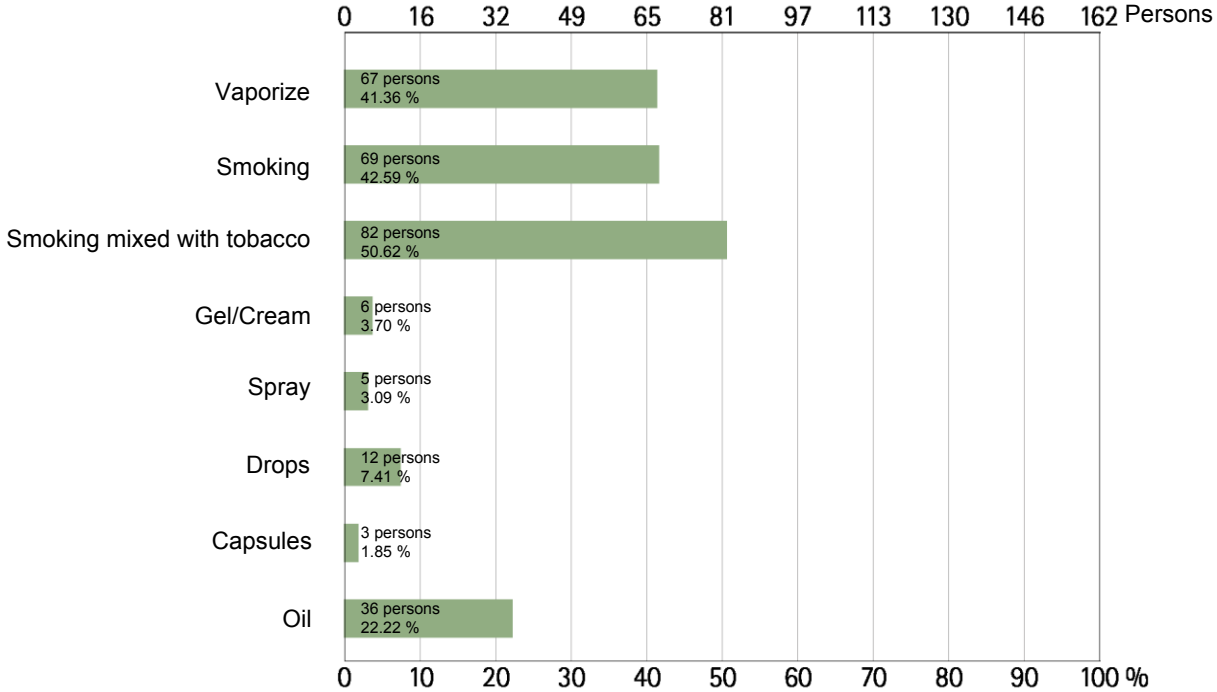
A5b. Which illnesses do you have which currently need treatment?



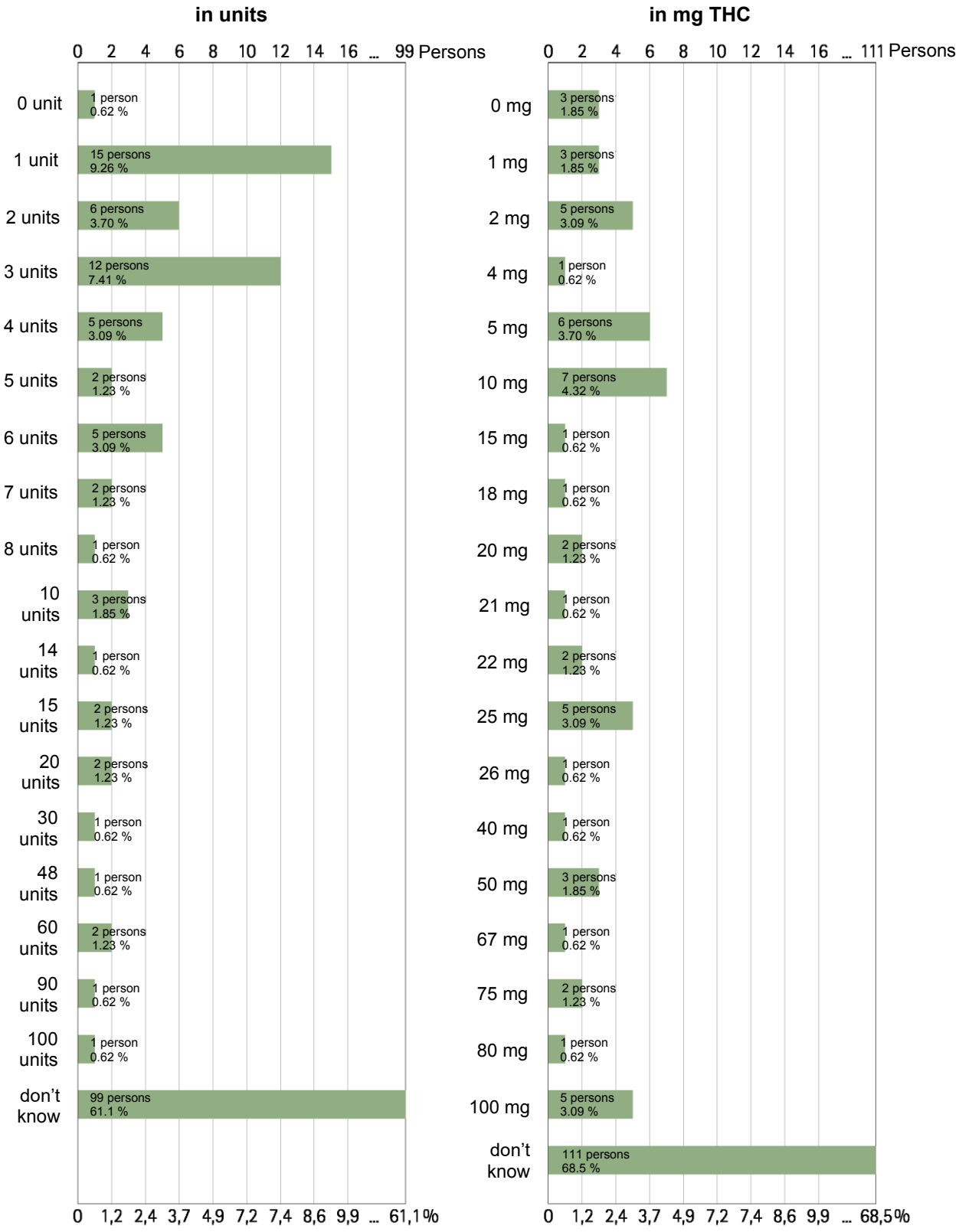
A6. Which varieties of cannabis did you use?



A7. In which mode of administration have you used cannabis?

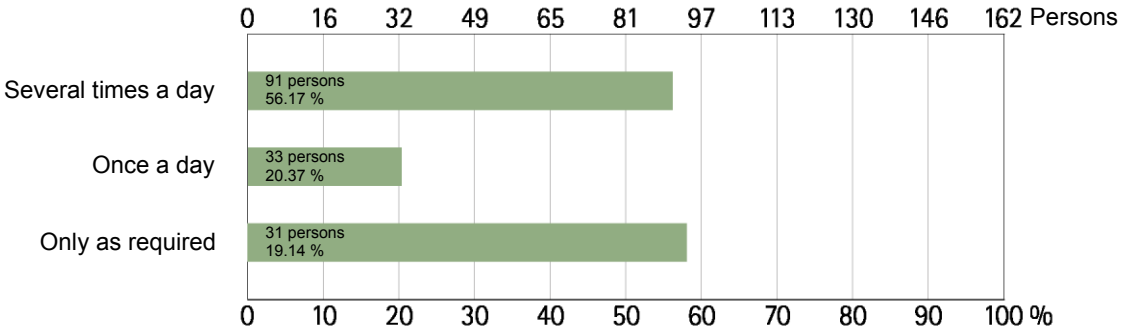


A8. What was the amount of cannabis that you used?*

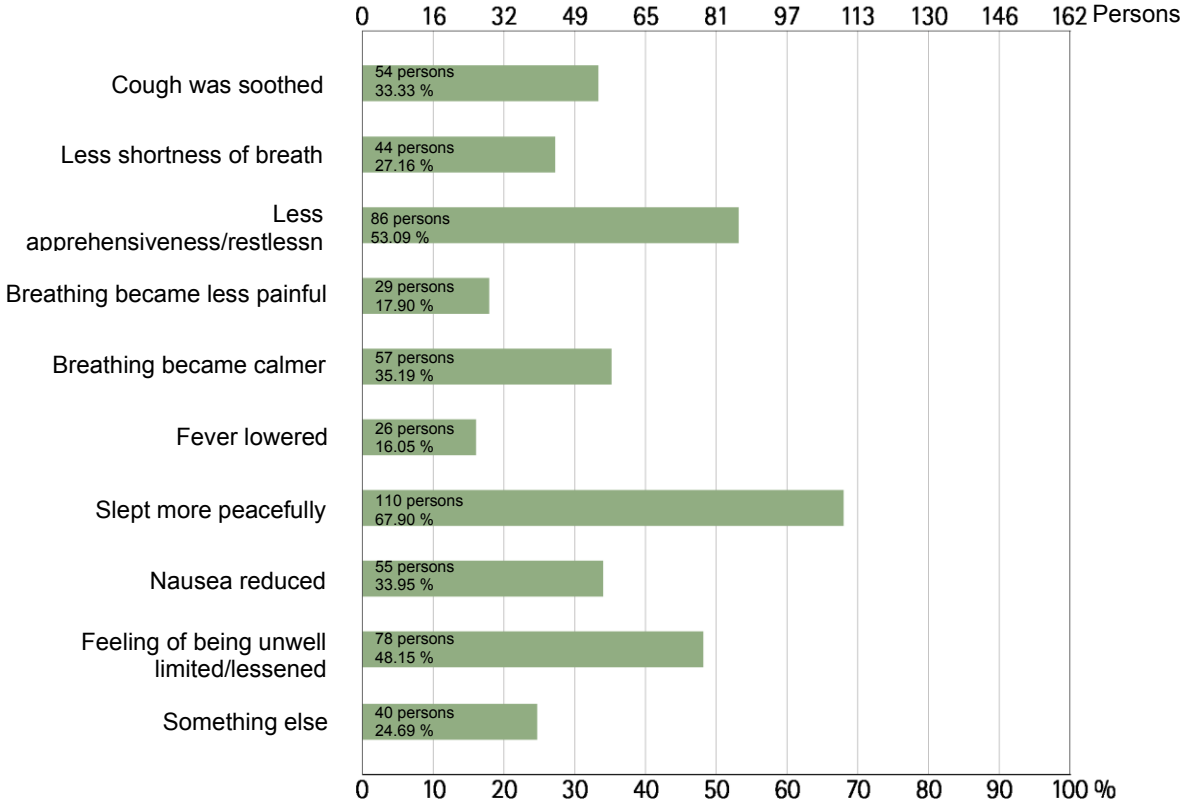


* Unlisted information on unit number/quantities was given by 0 persons and total to 0.0%.

A9. How often did you treat or care for yourself with cannabis?



A10. I could care for myself because I experienced the following effects with the help of cannabis:



Comments on “cough was soothed”

» Better able to cough it out

» The dry coughing was better within a really short time so that it was almost gone

» Less coughing

» In some instances took codeine in addition, limited soothing. No noticeable difference from cannabis. I make lozenges myself with caramel, chamomile extract and the THC extracts. These stimulate the salivary glands and THC also has a rapid effect on other symptoms via the oral mucous membranes.

» Little or no urge to cough now

» Not available

» After joint smoking airways get better

» On oral consumption
» Very easy expectoration
» Immediately soothed the attack

Comments on “Less shortness of breath”

» None at all any more
» Was taking in air better right away
» After one single, maximum 45 minute window with shortness of breath, no more incidents
» Had the feeling that the mucous loosened and I was getting more air
» Better able to cough it out

Comments on “less apprehensiveness/restlessness/anxiety”

» Slept better
» Only with Indicas, possibly, low-THC Sativas
» Paranoid feelings were equalised and I just go to sleep
» Calms the nerves
» Sleeping problems, especially, were practically no longer there because of it
» Absolutely helpful, also with any kind of depression
» THC takes away anxiety and really helps me deal with my symptoms

Comments on “breathing less painful”

» The scratchiness was also pretty immediately eased until you no longer felt it. No symptoms during the day.
» Little or no pain any more

Comments on “Slept more peacefully”

» Wellbeing
» Better
» Like a baby
» Always
» It was possible to sleep through here without being constantly awake
» Helped me to gather my strength, also helped against pain
» Always
» No more nightmares
» Less coughing, less anxiety, pleasant feeling

Comments on “Feeling of being unwell limited”

» ADHD, anxiety disorders
» Felt completely healthy when one vaped
» General feeling of being unwell considerably alleviated
» Remission
» More relaxed
» Less sore throat

Comments on “Something else”

» Also helped me take in food
» Appetite promoting

» Stopped headache
» The only symptoms I had were a slightly raised temperature, strong cough, moderate throat pain, moderate headaches; everything was immediately relieved and was completely gone after 3 days
» I felt that the psychoactive effect of the THC “covered” the symptoms of the disease, especially the headache
» Soothed headache
» Pain-free
» Apprehensive feelings due to disease were reduced
» Less pain
» Appetite for tasty food
» It helped me to manage with my mental illness in all respects!!!
» With headache/migraine or cramps (woman)
» Less conflict in the family because you feel calmer
» According to my observations, cannabis does not help against COVID-19 symptoms
» Alleviated anxiety and depression
» ADHD
» Alleviates pain
» Things simply go better with it, no matter what you have!
» Relaxed mood
» I’m a smoker, no illness and so on
» Amazing that you call that science. That was only meant sarcastically. Not allowed!!
» Against psoriasis
» Relaxation
» Symptom completely disappeared within 12 hours. Fever went down from 39.5° C to 37° C within 2 hours
» More balanced
» More carefree ;-)
» Incidentally, it also helps against other pain (see last question)
» It just does you good and inflammations caused by infections in the body heal up and I use CBD spray in the throat and that stops coughing and transmitting to others
» Just generally felt better, more balanced
» Overall relaxed
» …My foot was amputated 40 years ago because of an accident. With cannabis I am even able to inline skate by now.

Excursus: On the "Cannabis and COVID-19" research situation (Roundup in collaboration with Dr. Hans-Christian Voss)

Internationally available research findings derive their data from very different disciplines which concerns themselves with COVID-19. Here, we will discuss the already known basic mechanisms with regard to COVID-19 and reference the principal scientific resources on the topic. The relevance and reasons for the statements can thus be scientifically examined. The following lists feed the conviction that medicinal cannabis proves to be both useful in COVID-19 treatment and also has a prophylactic effect against the COVID-19 virus. **There is a remarkable feature here: that this therapeutic approach works on three level simultaneously and, in that sense, in a multi-modal manner; immune boosting, antiviral and immunomodulatory.**

The immunomodulation itself is controversial because it has been little researched as yet. However, the evidence is increasing that it works in two directions - boosting the immune system and down-modulating cytokines.

I. Immune system boosting

The scientific insights into the human cannabinoid system have now advanced to the stage where a "immuno-cannabinoid system" of the human body is referred to [10][5].

It was possible to demonstrate an increase in T-lymphocytes in patients following administration of THC (also Delta7- Delta9-THC), so that less severe disease progression is to be expected [3]. The Δ9-tetrahydrocannabinol (Δ9-THC) present in cannabis products (the psychotropic substance responsible for most of its immunologically active effects) has a procoagulant effect and can cause thrombocyte activation in physiological concentrations. The presence of CB1 and CB2 receptors (that is, the receptors which can be activated both by endo-cannabinoids and exo-cannabinoids) on the surface of human thrombocytes [4] was demonstrated in vivo - that is, in patient studies. Thrombocytes cause the staunching of internal and external bleeding after inflammations and injuries. Clinical studies on this topic indicate that host cell access for the virus can be reduced by 70% using cannabis medication [5]. There are case studies or smaller studies for many other indicators where, in part, astonishing findings are reported so that the legally requirement for a - *"not altogether remote prospect of appreciable positive effect"*[6] - has definitely been met [6].
This treatment is a non-invasive, easily practicable approach: treatment can be given in the form of drops, using pump stokes, taking capsules or by inhalation depending on the indications and patient preference, as with other medication.

II.Antiviral cannabis active substances

The cannabis derivative cannabigerol (CBG)[7] has proven to be a highly virucidal agent that can attack the (spike protein structure) surface membrane of pathogenic agents, including viruses and damage them in that way [7].

This has been demonstrated by now both in animal experiments on mice and in vitro in human cells. CBG has been used successfully at the McMaster University since 2020 against the previously untreatable MRSA pathogen [7]. At the forefront is the discovery that cannabis is especially successful in the fight against resistant pathogens when the cannabigerol extracted from it is used together with an antibiotic called polymyxin B [7]. However, CBG also attacks endogenous cells so that there is a need for further research here [7].

Cannabigerol in its pure form (silver bullet) has proven to be a strong virucide in therapy with antiviral medications (e. g. favilavir or ATR-002) [8]. This is also the reason that the Canadian company XPhyto, together with their subsidiary VectorPharma, are working on a transdermal cannabigerol-based COVID-19 therapeutic agent, based on thin-film strategy [thin-film therapy] [9].

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[5] T-cells (synonym for T-lymphocytes) are white blood cells which form a part of the adaptive immune system. They recognise exogeneous structures if these are present on an endogenous cell. There are various kinds of T-cells. Key cells are the those immune cells from the group of T-lymphocyte known as cytotoxic T-cells which recognise endogenous cells infected by viruses and can kill them [2]. Other T-cells activate B-cells which then form antibodies. In addition to the antibody-dependent arm of the immune system, the cellular arm is also capable of warding off exogenous materials or pathogens and developing immune protection against influenza viruses (coronavirus group) [2].

[6] Requirement which is demanded to justify regular treatment with medicinal cannabis.

[7] One of the constituents of cannabis

III. Immunomodulation

To date, it has been possible to observe the immunomodulatory effect of medicinal cannabis both in vitro (human cells) and in vivo, although in most cases this has been in connection with cancer research [10].

Under the pressure of the challenges currently faced, anti-inflammatory CBD as the pure substance (silver bullet) has already been deployed for immunomodulation in the treatment of COVID-19 [11]. Dr. Barak Cohen, senior anaesthesiologist and head of coronavirus management at Ichilov and one of the initiators of the project, emphasized that:

"This is a novel approach to treating some of the symptoms with a cannabis plant ingredient that is considered safe and non-addictive." [11]

The urgency of this part of the treatment is due to the immune system's dangerous overreaction (cytokine storm) after the body has already "defeated" the virus [12].

Cytokines distinguish cells from each other and also determine their reproduction. If too many immune cells are formed due to cytokines, the consequences, especially for the respiratory tract, can be more fatal than the infection itself: idiopathic fibroses occur, alveoli are destroyed, an exudate fluid is secreted and oxygen absorption becomes impossible.[8] Used as a "synergistic shotgun" [US medical jargon], cannabis can have a immunomodulatory effect since it has anti-inflammatory constituents in the flowers also [13a].

Most data on the clinical efficacy of THC are gained on the model of experimental autoimmune encephalomyelitis (EAE) an animal model for multiple sclerosis. Here, THC is able to prevent full development of clinical disease symptoms and suppress inflammatory infiltration of the spinal cord [13b], [14].

Furthermore, THC was able to induce apoptotic cell death in macrophages [15]. Studies in disease models related to the human immune system (including multiple sclerosis, diabetes, rheumatoid arthritis) show that the immunosuppressive characteristics of cannabinoids are effected via four main routes: (1) induction of apoptosis, (2) inhibition of cell proliferation, (3) inhibition of cytokine and chemokine production, (4) induction of regulatory cells.

In addition to inducing apoptosis in immune cells, cannabinoids can inhibit the release of a number of proinflammatory cytokines (IFN-γ, IL-1, IL-2, IL-6, TNF-α) [16]. In relation to CBD, it appears that this substance modulates cytokine release in macrophages in vitro and in vivo whereby it increases IL-12 production (proinflammatory) and reduces IL-10 (immunosuppressive) [10] [17]. In summary it can be said that THC, CBD and CBG work in complement to each other in immunomodulation on three levels. THCP[9] [18], first discovered in early 2020, is not yet included in this promising research.

Anxiolytic effects

In combination with the cannabinoids, the special properties of the terpenes (myrcene, limonene and pinene) with their anxiolytic effects are significant in healing and recovery (the entourage effect).

In the interim analysis of the German study "Self-care of Patients with COVID-19 Using Cannabis Part 1: Acute Illness" [19] it emerges that patients with positive COVID-19 test results primarily used cannabis to deal with fear: sleeping better, less apprehensiveness/restlessness/anxiety and limiting the feeling of being unwell. The fact that this was often present in how answer options were filled in highlights that the anxiolytic effects were not just tied to individual symptoms but were described in several dimensions. This underlines the high value which patients derived from it in managing their illness. Survey respondents also indicated that they registered calmer breathing (31%), nausea alleviated (31%), less shortness of breath (28%) and hence alleviation of an alarming shortness of breath; which could be seen as closely linked to the anxiolytic effect [20]. If only from the perspective of psychosomatic resources for amelioration and healing, these effects must be given a high valuation.

[8] In order to reduce the quantity of messenger substances, substances such as sodium meta-arsenite (NaAsO2) or interleukin 6 antagonists like the drugs Sarilumab or Tocilizumab are used to moderate/prevent a cytokine storm in the body's own immune system in this way.

[9] THCP is described as a sort of Super-THC with ten times its potency.

Summary

Reviewing the biochemical, virological and medical effect of cannabis, it becomes evident that an extraordinarily effective and moreover non-invasive approach can be developed using medicinal cannabis with which the prevention and treatment of and convalescence from COVID-19 disease can be managed in a way that is more than just complementary. Therefore political courage and decisiveness are especially needed to prioritise the appropriate research and to begin with careful trial therapies if patients desire or request them - a practice which it should be possible to organise in a low-threshold and not too regimented manner. Why is such a risk-free process not mandated in Germany?

The hitherto rather restrictive political way of dealing with cannabis as medicine has also unfortunately resulted in Germany being very constrained in recommending or even initiating clinical applications with policy decisions. This is due to cannabis raw material being not that easy to access because it is mostly imported. Its quantity and quality is hence largely dependent not only on foreign providers but also on their restrictions in the event of supply bottlenecks. At present, export is no longer permitted in Israel, in Canada the goods are also being retained in the country even though the industry there is still permitted to produce during the pandemic following a government decision. This is aggravated due to the restricted transport and delivery options caused by the current pandemic.

The consequence must therefore be rapidly developing our own supply structures within the country in order to become more independent in the availability of an effective, non-invasive phytopharmaceutical therapeutic agent.

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