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Is a Self-Help Web-Based ACT Intervention More Effective Than Bibliotherapy in the Management of Chronic Pain?

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Chronic Pain in the World

- The leading cause of disability and disease burden in the world
- Estimates suggest that globally, **1 in 5 adults** suffers from chronic pain
- Increased risk of developing
  - mood disorders
  - anxiety disorders
  - substance use problems
- Risk of suicide twice as high

REFERENCES
Vos et al., 2016; Goldberg & McBee, 2011; WSP, n.d.; Demyttenaere et al., 2007; Tang & Crane, 2006; Dear et al., 2014

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ACT, an established treatment for pain

- Acceptance and Commitment Therapy (ACT) is a stand-alone treatment
- Well-established treatment for chronic pain in general (including numerous conditions) – Division 12 (APA)

STRENGTH OF RESEARCH SUPPORT

Empirical Review Status			
2015 Criteria (Tolin et al. Recommendation)	Treatment pending re-evaluation		
1998 Criteria (Chambless et al. EST)	Strong ✓	Modest	Controversial

REFERENCES
https://www.dr12.org/treatment/acceptance-and-commitment-therapy-for-chronic-pain/

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Accessibility Remains a Major Challenge

- Long wait lists
- Distance from major cities
- Difficulties linked to mobility or transportation
- Costs associated with treatment ($)
- Lack of qualified professionals
- Stigma
- Current barriers to face-to-face treatment due to Covid-19

REFERENCES:
Cavanagh et al., 2014; Dear et al., 2018; Pengel et al., 2017

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What is a Self-Help?

- " Self-administered " and based on " evidence-based treatment " (Nice, 2004)
- "Guide and encourage the patient to make changes… rather than just provide information" (Anderson et al., 2005; p. 387)

Level of guidance of therapy	Present study
1. Self-Administered	
2. Predominantly Self-Help	✓
3. Minimal Contact	
4. Predominantly Therapist-Administered	

REFERENCES:
Nice, 2004; Anderson et al., 2005; French et al., 2017

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Various Self-Help Formats for Chronic Pain

- Bibliotherapy
  - Veillette et al. (2019); Johnston et al. (2010); Thorsell et al. (2011)
- Applications on mobile phones
  - Kristjánsdóttir et al. (2013); Lappalainen et al. (2013)
- Web-based
  - Fledderus et al. (2015); Ljotsson et al. (2014); Sullivan et al. (2018); Lin et al. (2017); Scott et al. (2018); Sinister et al. (2018); Buhrman et al. (2013); Trompetter et al. (2014)

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Current Gaps in the Literature

- Effectiveness results based on ACT **self-help cannot be fully generalized** and **further research** is required
- While self-help are well disseminated, there is criticism about **over-claiming empirical support** for published self-help books
- Results based on **format** (book vs web-based) of intervention remain unclear
- More research is needed to better understand **psychological processes** associated with outcomes and **long-term benefits**

REFERENCES
Cavanagh et al., 2014; French et al., 2017; Brown et al., 2016; O'Donohue et al., 2016; Rosen & Lilienfeld, 2016

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Aim of the Current Study

Evaluate **whether guided self-help programs based on ACT** result in greater change in the reduction of disability (primary), anxiety/depression and improvement of quality of life (secondary variables) among people suffering from chronic pain

1) ACT Web-based > Education
2) ACT Bibliotherapy > Education
3) Web-based > Bibliotherapy

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Method: Trial Design

- Randomized-controlled trial (RCT) comparing two experimental ACT groups to an active control group (education)
- 3-armed – parallel groups
- The intervention was over a period of 9 weeks
- Longitudinal with repeated measures
  - pre, post, 3 and 6 months
  - 11 weekly measures (7 diary items)

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Method: Approval and Ethics

- Ethics certificate CDERS-17-11-06.05 (Feb 5, 2018)
- Registration on Clinicaltrials.gov – NCT03711851 (20 Oct. 2018)
- Consort-ehealth statement was followed to ensure optimal reporting of the protocol (Eysenbach et al., 2011)

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Method: Eligibility Criteria

- ✓ **18 years or older** and **residing in Canada**
- ✓ Non-cancer related **pain every day for at least 6 months**
- ✓ Having an **average pain level of at least 4/10** within the past week
- ✓ **Reading** and **writing** abilities equivalent or superior to **grade 8**
- ✓ **Internet access** at home as well as a **valid e-mail address**
- ✓ **Never** having taken part in an **ACT therapy** and/or **practiced mindfulness meditation** and/or **having read the book** used in the study
- ✓ **Not being in an unstable psychological situation** (e.g. severe suicidal thoughts)
- ✓ **Stable medication** for at least one month

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Method: level of guidance/blindness

Weekly e-mails Monday AM for a total of 9 weeks

Access to research assistants for questions

2 phone calls (Week 0 and 4), minimal contact

Blind	Present study
Participant	Not possible
Co-intervention (assistant researcher)	Difficult
Data analysis	✓

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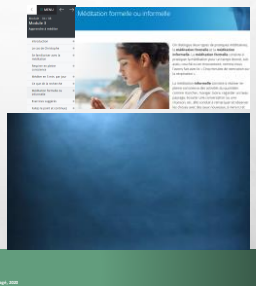
Method: Material

1. WEB-BASED INTERVENTION



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Method: Material

2. BIBLIOTHERAPY

3. EDUCATION (BROCHURE)

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Method: weekly content of interventions

Week	Web-Based	Bibliotherapy	Education
1	**Module 1**: Psychoeducation about pain and information about ACT approach	**Chapters 1 to 4**: Psychoeducation about pain and information about ACT approach	Chronic pain: recognizing and treating it; How to speak to your doctor…
2	**Module 2**: Redefining your deepest values	**Chapter 11**: Values	Don't stay alone in the face of pain! Information for families and friends
3	**Module 3**: Learn to meditate	**Chapter 5**: Present-moment awareness	Controlling your breath to relieve your pain: a solution for all
4	**Module 4**: Committed action	**Chapters 6 and 7**: Committed action	Physical activity to reduce pain… essential to treatment! Sexuality and intimacy.
5		**One week-break**	
6	**Module 5**: Willingness to feel pain	**Chapters 8 and 13**: Willingness to feel pain	When emotions get involved…
7	**Module 6**: Defuse from your negative thoughts	**Chapters 9-10**: Defuse from your negative thoughts	To finish with stress!
8	**Module 7**: Finding the right balance in your activities	**Chapter 12**: Finding the right balance in your activities	Managing your energy to better control your pain. Nutrition and chronic pain.
9	**Module 8**: Conclusion: it's just the beginning	**Chapters 14, 15 and Conclusion**: it's just the beginning	Adopt good sleep habits. Everything you need to know about pain medication.

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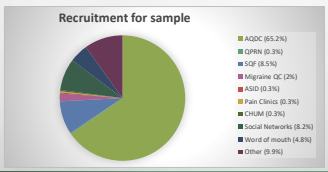
Method: Participant Recruitment



Mailing lists, social media (e.g. Facebook)

The majority of participants were recruited through various patient associations (76%)

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Method: Participant Flow

770 individuals assessed for eligibility

Excluded (n= 473)
Did not meet inclusion criteria (n= 234)
Refused to participate or did not fully complete baseline questionnaires (n= 239)

297 individuals enrolled and randomized

Pre	**Web-based ACT (n= 98)**	**ACT bibliotherapy (n= 98)**	**Education pamphlet (n= 97)**
Post	Completed (n= 65) Discontinued (n= 9) Lost to follow-up (n= 24) Attrition (n= 33): 33.67%	Completed (n= 70) Discontinued (n= 8) Lost to follow-up (n= 20) Attrition (n= 28): 28.57%	Completed (n= 68) Discontinued (n= 12) Lost to follow-up (n= 17) Attrition (n= 28): 29.89%
3-month follow-up	Completed (n= 63) Attrition (n= 2): 35.71%	Completed (n= 62) Attrition (n= 8): 36.73%	Completed (n= 53) Attrition (n= 15): 45.36%
6-month follow-up	Completed (n= 44) Attrition (n= 19): 55.10%	Completed (n= 49) Attrition (n= 13): 50%	Completed (n= 47) Attrition (n= 6): 51.54%

Method: Measures

Primary outcome	Secondary outcomes	Process variables
Impact of pain on daily functioning • **Brief Pain Inventory (BPI)** • 10 items	Depression/Anxiety • **Hospital Anxiety and Depression Scale (HADS)** • 14 items Quality of life • **World Health Organization Quality of Life (WHOQOL-BREF)** • 26 items	• **Chronic Pain Acceptance Questionnaire (CPAQ)** • 8 items • **Multidimensional Psychological Flexibility Inventory (MPFI)** • 24 items • **French-Canadian Chronic Pain Self-Efficacy Scale (FC-CPSES)** • 6 items

REFERENCES
Cleeland & Ryan, 1994; Cleeland, 2009; Tyler et al., 2002; Pouchpa et al., 2007; Bourgault et al., 2010; Zigmond & Snaith, 1983; Savard et al., 1998; Hermans, 1997; Roberge et al., 2013; Group, 1998; Bouchard et al., 2010; Kelly, Kugge & Wilson, 2004; Fish et al., 2010; Scott et al., 2010; Lacasse et al., 2015; Lang et al., 1996.

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RESULTS

Sociodemographic information	Web-based (n = 98)	Bibliotherapy (n = 98)	Education (n = 97)
Age	**M (SD)**	**M (SD)**	**M (SD)**
	50.97 (11.23)	50.85 (11.67)	51.37 (11.81)
Gender	**n (%)**	**n (%)**	**n (%)**
Women	**88 (89.8%)**	**91 (91.9%)**	**86 (89.6%)**
Men	10 (10.2%)	8 (8.1%)	10 (10.4%)
Ethnicity			
White/Caucasian	**91 (93.8%)**	**87 (89.7%)**	**87 (92.6%)**
Black	-	-	1 (1%)
Aboriginal/First Nations/Metis	3 (3.1%)	3 (3.1%)	1 (1%)
Hispanic	2 (2.1%)	-	2 (2.1%)
Asian	1 (1%)	-	-
Level of education			
High School	14 (14.3%)	21 (21.2%)	23 (24%)
College studies or CEGEP	**44 (44.9%)**	**40 (40.4%)**	**37 (38.5%)**
University (Undergraduate)	24 (24.5%)	29 (29.3%)	27 (28.1%)
University (Graduate)	16 (16.3%)	9 (9.1%)	9 (9.4%)

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RESULTS

Sociodemographic information	Web-based (n = 98)	Bibliotherapy (n = 98)	Education (n = 97)
Main diagnosis of chronic pain	**%**	**%**	**%**
Headaches (migraines)	2.0	6.1	11.5
Fibromyalgia	**37.8**	**39.4**	**44.8**
Back pain	11.2	12.1	12.5
Neck pain	7.1	4.0	2.1
Neuropathic Pain	8.2	7.1	3.1
Musculoskeletal Pain	16.3	6.1	12.5
Arthritis	5.1	5.1	1.0
Chronic Post-Surgical Pain	1.0	3.0	3.1
Complex Regional Pain Syndrome	2.0	4.0	-
Other	9.2	13.1	9.4
Opioid use			
Yes	34.7	40.8	47.9
Presence of recently diagnosed mental disorder			
Yes	37.8	30.3	31.6

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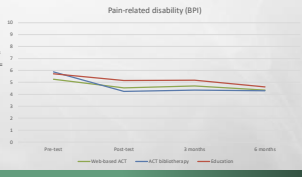
RESULTS

PRIMARY OUTCOME: PAIN DISABILITY

- Results of MLM showed a **significant interaction effect** group*time: $f(4, 395.75) = 4.22$, $p = .002$* **in favor of the ACT bibliotherapy group**
- Subsequent analyses directly comparing each group and time points revealed that **from pre to post, the ACT bibliotherapy group showed greater reductions in BPI scores than the education group** ($t(149.01) = 3.138$, $p = .002$*) **and the web-based ACT group** ($t(164.81) = -2.308$, $p = .022$*)
- Differences were also significant **between pre-test and the 3-month follow-up**, again with **the ACT bibliotherapy group showing greater reductions in BPI scores than the education group** ($t(140.55) = 2.88$, $p = .005$*) and the **web-based ACT group** ($t(155.10) = -2.64$, $p = .009$*)
- No statistically significant differences were found between post-test and 3-month follow-up (results were maintained)



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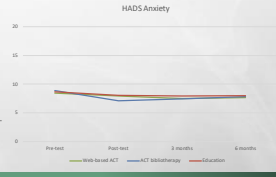
RESULTS

SECONDARY OUTCOMES: **ANXIETY**

- Results of MLM showed a **significant interaction effect group*time:** (f(4, 380.24) = 3.10, p = .016) **in favor of the ACT bibliotherapy group**
- Subsequent analyses directly comparing each group and time points revealed that **from pre to post, the ACT bibliotherapy group showed greater reductions in anxiety scores than the education group** (t(143.08) = 2.41, p = .017*) **and the web-based ACT group** (t(145.40) = -3.04, p = .003*)
- **Between pre-test and the 3-month follow-up, there was a statistically significant difference in favor of the ACT bibliotherapy group compared to the education group** (t(131.07) = 2.45, p = .043), and a marginally significant difference compared to the web-based ACT group (t(131.01) = -1.78, p = .077)
- Between post-test and the 3-month follow-up, there was a marginally significant difference in favor of the ACT bibliotherapy group compared to the web-based ACT group (t(110.16) = 1.75, p = .083)



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RESULTS

SECONDARY OUTCOMES: **DEPRESSION**

- Results of MLM showed a **significant effect for time** (f(2, 373.20)= 19.17, p = .0001*), suggesting that **the more time advanced, the more scores of depression decreased**
- Differences in groups were not statistically significant and neither was the interaction effect

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RESULTS

SECONDARY OUTCOMES: **QUALITY OF LIFE**

- Results of MLM showed a **significant effect for time** (f(2, 357.78)= 36.15, p = .0001*), suggesting that **the more time advanced, the more quality of life scores increased**
- Differences in groups were not statistically significant and neither was the interaction effect

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A word on adherence…

7.18 6.82 7.39*

- Results from a One-way ANOVA showed that participants in the education group participated significantly more than participants in the ACT bibliotherapy group ($F(2, 173) = 4.02$, $p = .02$)

DISCUSSION

- In sum, **all three self-help programs showed improvements** from pre to post for
  - Pain-related disability
  - Anxiety and depression
  - Quality of life
- **ACT bibliotherapy showed greater reductions in pain disability and anxiety but not on depression or quality of life**
- Web-based ACT was not more effective than ACT bibliotherapy or education on pain

DISCUSSION

Study strengths:

- Comparison of two treatment formats (web vs. book)
- Large sample size (N= 297)
- Active control group
- Statistical analyses (Mixed Linear Models)

Limitations:

- Sample from the community, mostly women, average age of 50
- No "blindness" for participants or research assistants
- Variation in the amount of content
- Self-report measures and adherence to treatment was self-reported
- High attrition rate (≥50%)

Future Directions

Analyze longitudinal data for the study (diary items) and process variables

- Identify and describe trajectories of change (6) in disability during the intervention
- Identify characteristics and baseline predictors of trajectory membership
- Identify trajectory groups associated with greater/poorer outcomes

QUESTIONS?

THANK YOU FOR YOUR ATTENTION