Effects of a brief web-based intervention on motivation, attitude, and physical activity in adults

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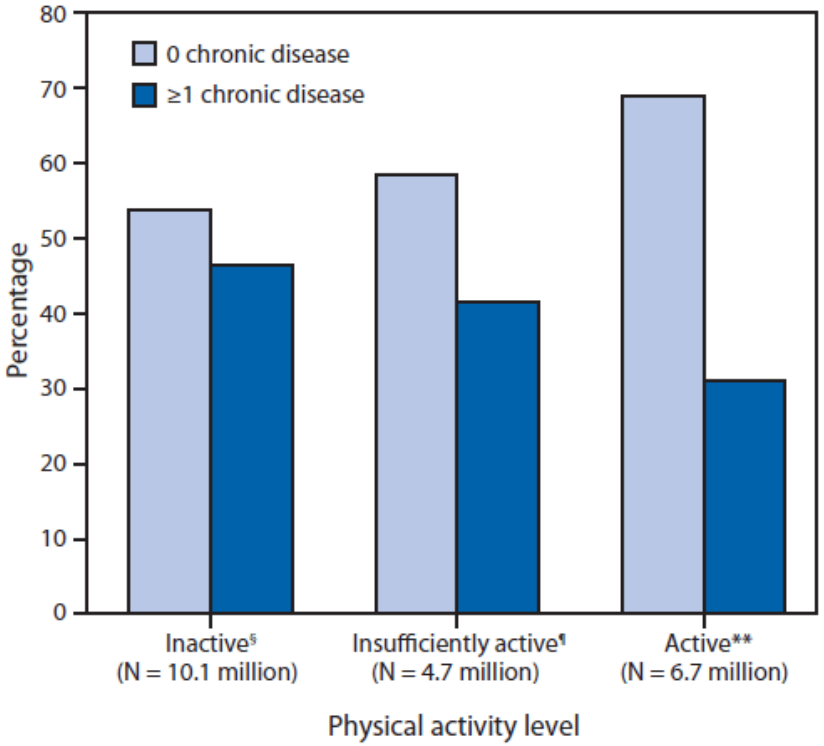
Presentation Overview

- Thesis
  - Background
  - Purpose/Hypothesis
  - Methods
  - Results
  - Discussion/Conclusion
- Field Experience
  - Activities completed
  - Public Health Core Competencies

The Problem

- 80% of Americans are insufficiently active
- 25% engage in no leisure time physical activity
- Consequences:
  - Increased chronic disease
  - Lower quality of life
  - Over-burdened healthcare system



CDC, 2016; CDC, 2014

Solution: Increase physical activity

BUT

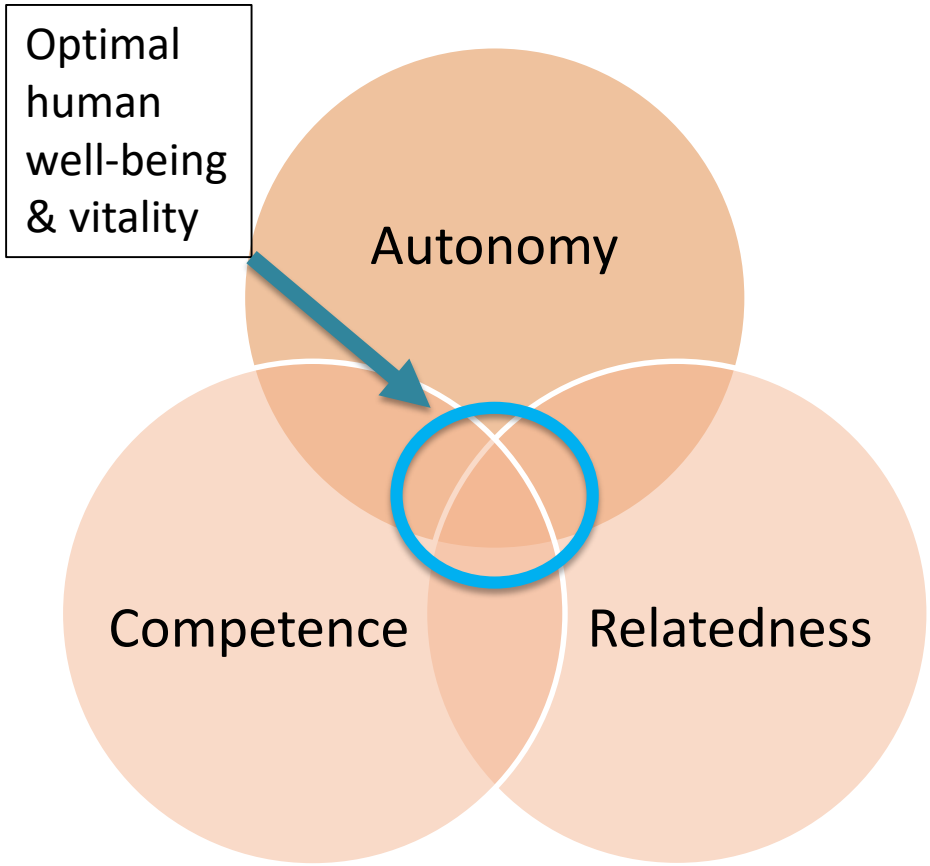
that is much easier said than done….

Why we *still* have this problem?

- Knowledge does not always translate to behavior
  - Graduates aware of health behaviors still did not engage in a 'healthy' lifestyle
- Blocked by barriers at multiple levels
  - Individual, social, & environmental
- Motivation is necessary to translate knowledge to action
  - Concept of motivation is broken down by the Self-Determination Theory (SDT)

Koehn et. al, 2016

Self-Determination Theory (SDT)

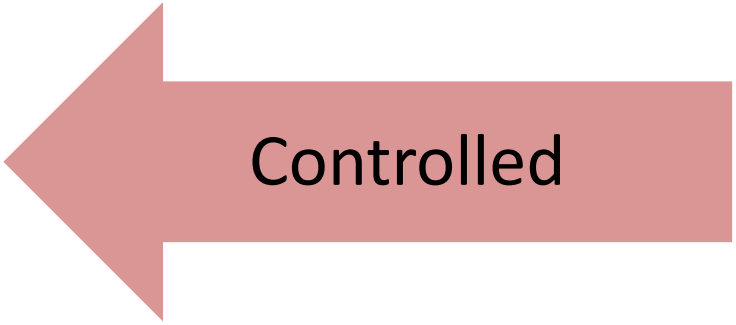


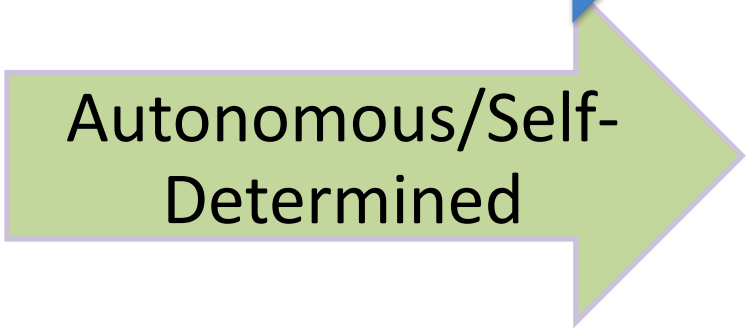
- Autonomy
  - Desire to feel in control of one's life; actions are self-endorsed
- Competence
  - Feeling confident and effective in one's actions
- Relatedness
  - Need to feel connected to others/sense of belonging

Deci & Ryan, 2000; Ryan & Deci, 2008

SDT – Motivation Spectrum

Amotivation	External	Introjected	Identified	Integrated	Intrinsic
• Complete absence of motivation	• To achieve *External* reward/ avoid *external* punishment	• To achieve *Internal* reward or avoid *internal* punishment	• Of personal value or importance	• Part of one's sense of self	• Done for inherent enjoyment or personal satisfaction



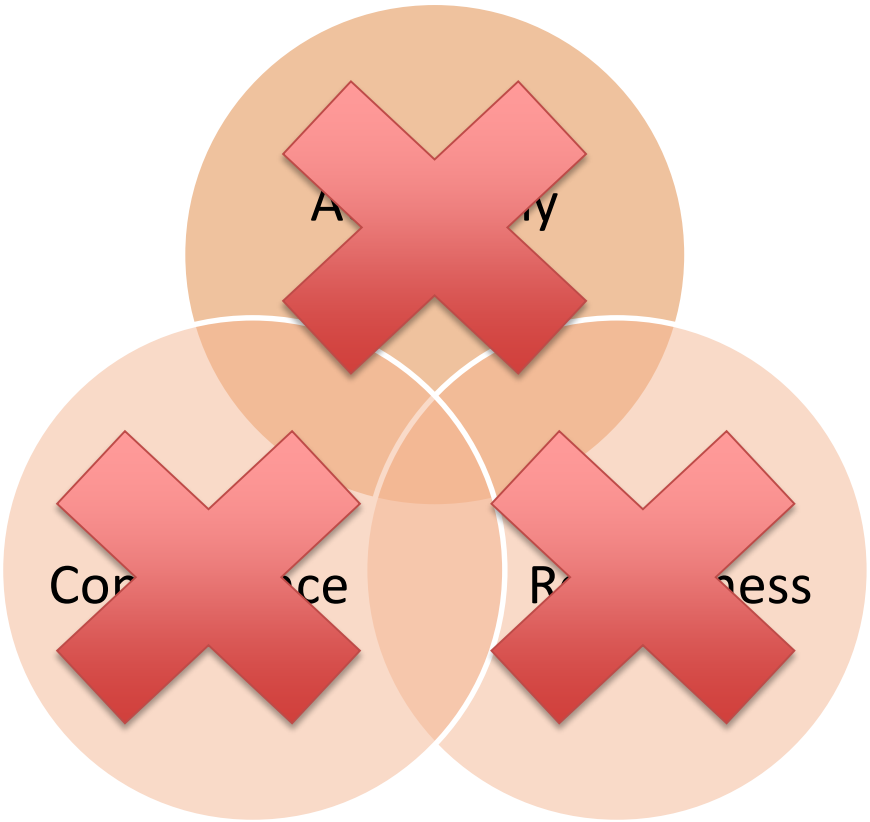


Deci & Ryan, 2000; Ryan & Deci, 2008

Inactivity problem explained by SDT

- Undermines Autonomy
  - Feel ‘should’ be active
  - Focus on external motives
- Undermine Competence
  - What ‘counts’
- Undermines Relatedness
  - Minimal focus on social benefits of being active with others

Ekkekakis, 2013; Segar, et. al., 2017; Segar et. al., 2016; Teixeira et. al, 2012



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Long Term

Supporting physical activity via SDT

- Re-define physical activity to be any movement
  - Emphasize enjoyable activities
- Promote identification of personally valuable outcomes that one CHOOSES to pursue
  - Internal motivation = more sustainable
- Focus on immediate benefits

Deci & Ryan, 2000; Ryan & Deci, 2008; Ekkekakis, 2013; Segar, et. al., 2017

Previous SDT Interventions

- Some success at promoting a sustained behavior change w/ 2 year follow-up
- Typically include:
  - In-person meetings
    - One-on-one counseling
    - Group sessions
  - 6+ week interventions
- Resource-intensive intervention strategies

Teixeira et. al, 2012; Segar, et. al., 2002; Silva et. al, 2010

Internet-Based Interventions

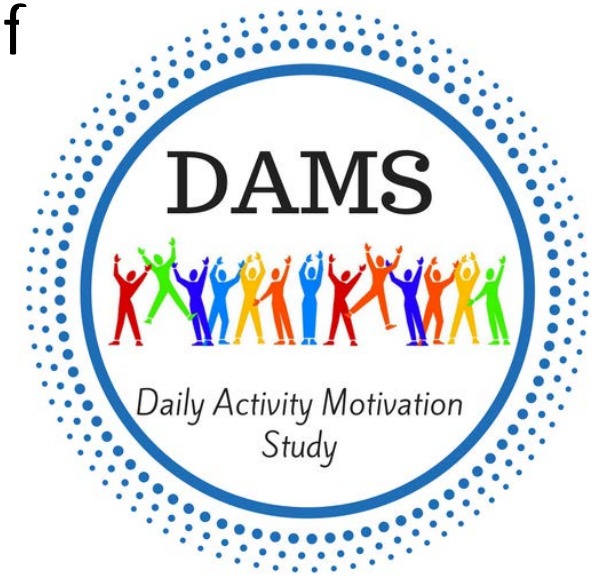
- Greater effects on physical activity with:
  - More behavior change techniques
  - More interaction
  - Theoretical basis
- Intervention period: from 6 weeks - 12+ months
- Remaining Questions:
  - Can SDT-based strategies be implemented online?
  - What is the minimum time-frame (or dose) necessary for a sustainable change?

Joseph et. al, 2014; Webb et. al, 2010; Lustria et. al, 2013

Study Purpose + Hypothesis

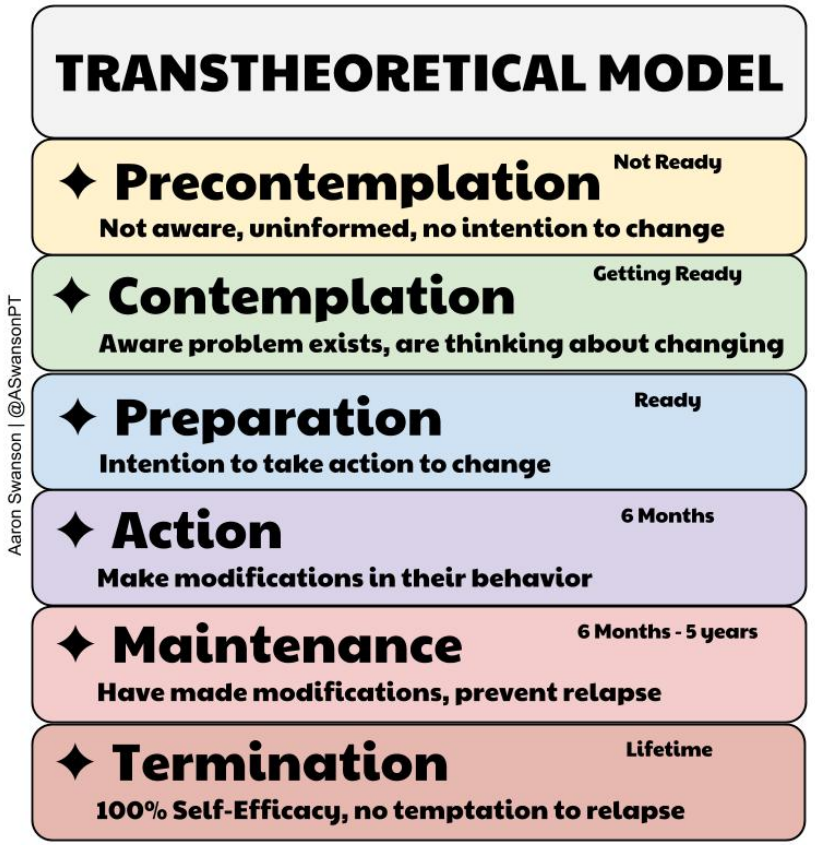
- Purpose: Compare the impact of brief online interactive modules with information-based controls

- Hypothesis: Participants completing the interactive modules will have greater increases in psychological variables and physical activity behavior compared to the control group

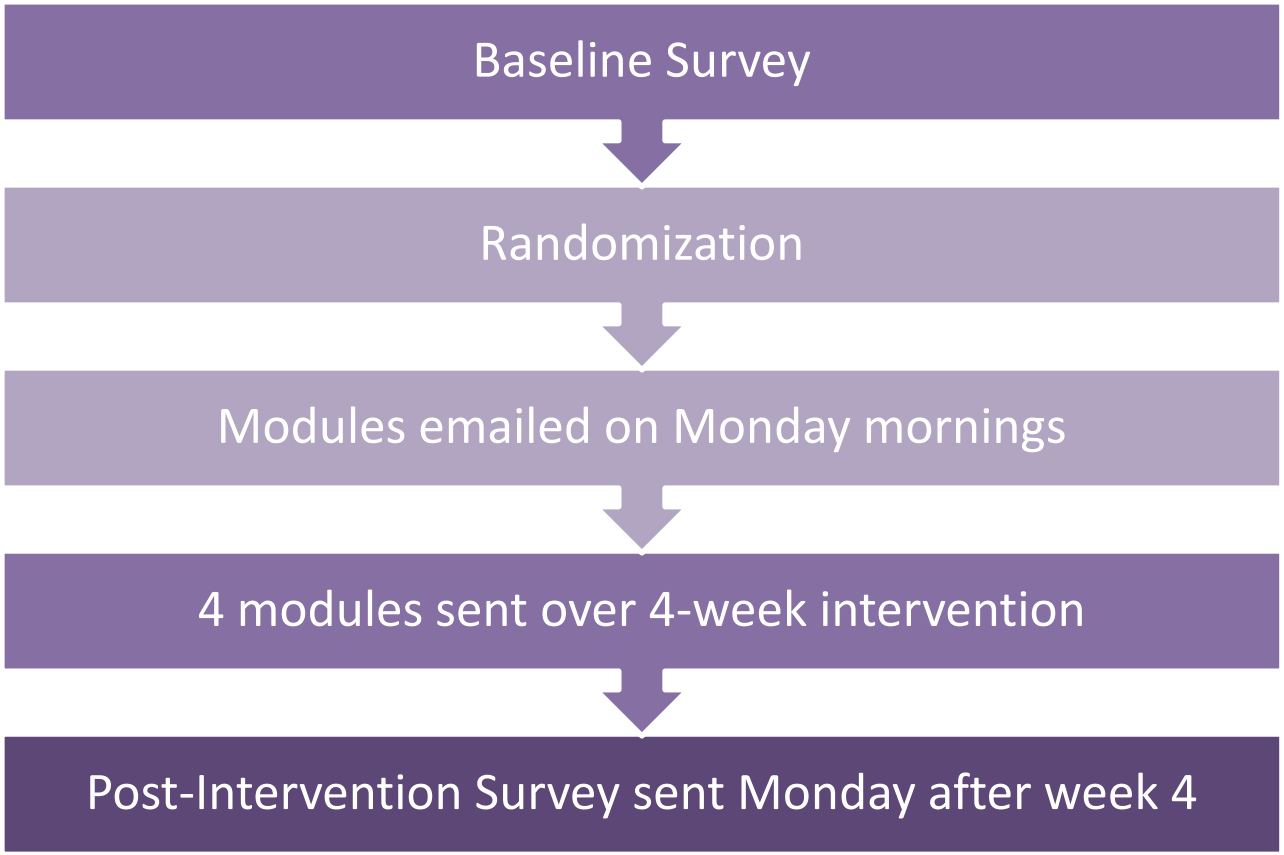


Participants

- Target Population:
  - Adults ages 22-45
  - Not currently in a physical activity routine
  - Not pregnant, spoke English, reliable internet access, no limiting health conditions
- Recruitment Strategy:
  - K-State Today
  - Social Media



Procedure



2 waves of data collection:

October 2017

January 2018

Autonomous Motivation

- BREQ-3 (24-items)
  - Amotivation: *"I don't see why I should have to exercise"*
  - External: *"I exercise because other people say I should"*
  - Introjected: *"I feel guilty when I don't exercise"*
  - Identified: *"It is important for me to make the effort to exercise regularly"*
  - Integrated: *"I consider exercise consistent with my values"*
  - Intrinsic: *"I exercise because it's fun"*
- 4 items for each motivation sub-scale

Markland & Tobin, 2004; Wilson, Rodgers, Loitz, & Scime, 2006

Autonomous Motivation - cont'd

- Calculation of Relative Autonomy Index (RAI)
  - Averaged subscale scores
  - Weighted average scores
  - Summed weighted values

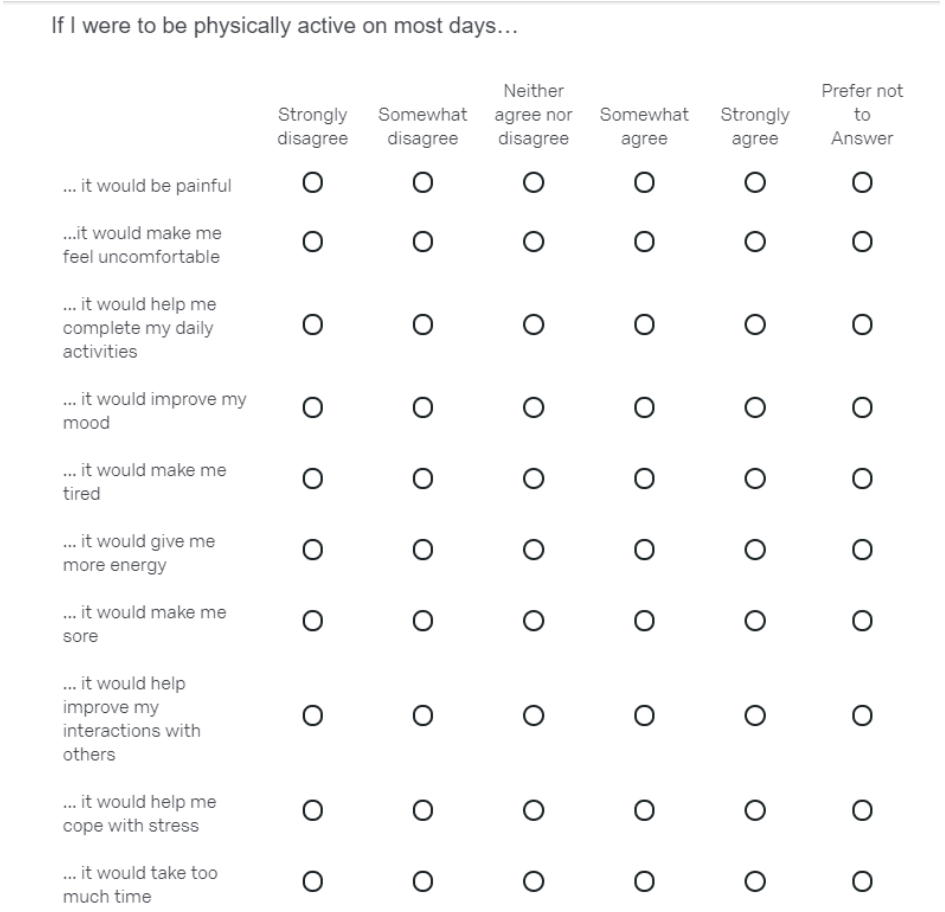
Amotivation	-3
External regulation	-2
Introjected regulation	-1
Identified regulation	+1
Integrated regulation	+2
Intrinsic regulation	+3

- Higher, more positive scores = greater autonomy

Markland & Tobin, 2004; Wilson, Rodgers, Loitz, & Scime, 2006

Attitude

- 10 items
  - Positive: *"… it would improve my mood"*
  - Negative: *"…it would be painful"*
  - Likert Scale:
    (1 = *Strongly Disagree;*
    5 = *Strongly Agree)*



If I were to be physically active on most days…

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	Prefer not to Answer
… it would be painful	O	O	O	O	O	O
…it would make me feel uncomfortable	O	O	O	O	O	O
… it would help me complete my daily activities	O	O	O	O	O	O
… it would improve my mood	O	O	O	O	O	O
… it would make me tired	O	O	O	O	O	O
… it would give me more energy	O	O	O	O	O	O
… it would make me sore	O	O	O	O	O	O
… it would help improve my interactions with others	O	O	O	O	O	O
… it would help me cope with stress	O	O	O	O	O	O
… it would take too much time	O	O	O	O	O	O

Nelson, Benson, & Jensen, 2009; Motl, et al., 2000

Perceived Behavioral Control

- 5 items

Rate your agreement with the following statements:

	Strongly Disagree		Neutral		Strongly Agree
	1	2	3	4	5
I have control over my being physically active on most days	○	○	○	○	○
I believe I have all the things I need to be physically active on most days	○	○	○	○	○
If I want to be I can be physically active on most days	○	○	○	○	○

Please rate the ease or difficulty for the following tasks:

Very Difficult 1 2 Neutral 3 4 Very Easy 5

For me to be physically active on most days would be...

For me to adopt a more physically active lifestyle would be..

Motl, et. al, 2000

Exercise Identity

- 9 items
  - Likert scale *(1 = Strongly Disagree; 7 = Strongly Agree)*

The following questions concern your personal beliefs about exercise. Please indicate the extent to which you agree or disagree with each statement when thinking about your exercise participation:

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree	Prefer not to answer
I consider myself an exerciser	○	○	○	○	○	○	○	○
When I describe myself to others, I usually include my involvement in exercise	○	○	○	○	○	○	○	○
I have numerous goals related to exercising	○	○	○	○	○	○	○	○

Wilson & Muon, 2008; Anderson & Cychosz, 1994

Intentions

- 1 item

Please indicate the number of days you intend to take part in physical activity during the next week:

0 1 2 3 4 5 6 7

I plan to take part in regular physical activity on this many days:

Physical Activity (MAQ)

- Indoor vs. Outdoor

Look through the following list of **INDOOR** activities, and for each one you have done in the past 7 days mark the total number of minutes you spent in that activity on the respective day. If you did not participate in some of the activities then you can leave those spaces blank.

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Aerobic Dance/Step Aerobics							
Badminton							
Basketball (Indoor)							
Bicycling (indoor)							
Bowling							
Circuit Training							
Dancing							

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Elliptical Trainer							
Jogging (indoor)							

Look through the following list of **OUTDOOR** activities, and for each one you have done in the past 7 days mark the total number of minutes you spent in that activity on the respective day. If you did not participate in some of the activities then you can leave those spaces blank.

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Basketball (outdoor)							
Bicycling (outdoor)							
Canoeing/Rowing/Kayaking							
Dancing							
Football/Soccer							
Gardening/Yardwork							
Golf							
Hiking							
Jogging (outdoor)							
Walking for Exercise							
Walking as a part of daily activities							
Other:							
I was not active outdoors during the past week (please enter 0 for each day)							

Pettee, McClain, Schmid, Storti, & Ainsworth, 2011

Module Topics Overview

Module 1	Module 2	Module 3	Module 4
The reason WHY	Physical activity guidelines	Self-regulation + activity planning	External influences
Benefits of physical activity	Re-defining physical activity	Common barriers & ways to overcome them	Social support
	Tips to get more PA into the day		Ways to enhance environmental support

Intervention Modules

- Create autonomy-supportive environment
  - Pre-post module reflection questions
    - Ex. List 3 reasons why you want to increase your physical activity
  - Weekly 'Bonus' Activity
  - Within-module reflection questions
- Enhance perceived competence
  - Re-defined physical activity
  - Weekly activity planning sheet
  - If… Then… barrier planning

Control Modules

- Generic information and advice
  - Increasing PA throughout the day
  - Overcoming barriers
- No opportunity to type responses
- No planning sheets included
- Take-home activities assigned

Example: Intervention Module 1

BENEFITS OF PHYSICAL ACTIVITY

ENGAGING IN PHYSICAL ACTIVITY ON A REGULAR BASIS CAN BENEFIT YOU IN ALL AREAS OF YOUR LIFE

Physical Health

- Stronger Heart
- Better Posture
- Fight off Illnesses Better
- Weight Control
- Better Health
- Stronger Muscles
- Improved Quality of Life

Mental Health

- Reduce Depression
- Reduce Anxiety
- Sleep Better
- Reduce Stress
- Improved Cognitive Function
- Increased Mental Alertness

Social Health

- Build Social Skills
- Meet New People
- Strengthen Relationships
- Create New Friendships
- Increase Time Spent with Family and Friends

Emotional Health

- Improved mood
- Increased Feelings of Happiness
- Better self-esteem
- Lower Tension & Feelings of Anger
- Increased Feeling of Self-Worth

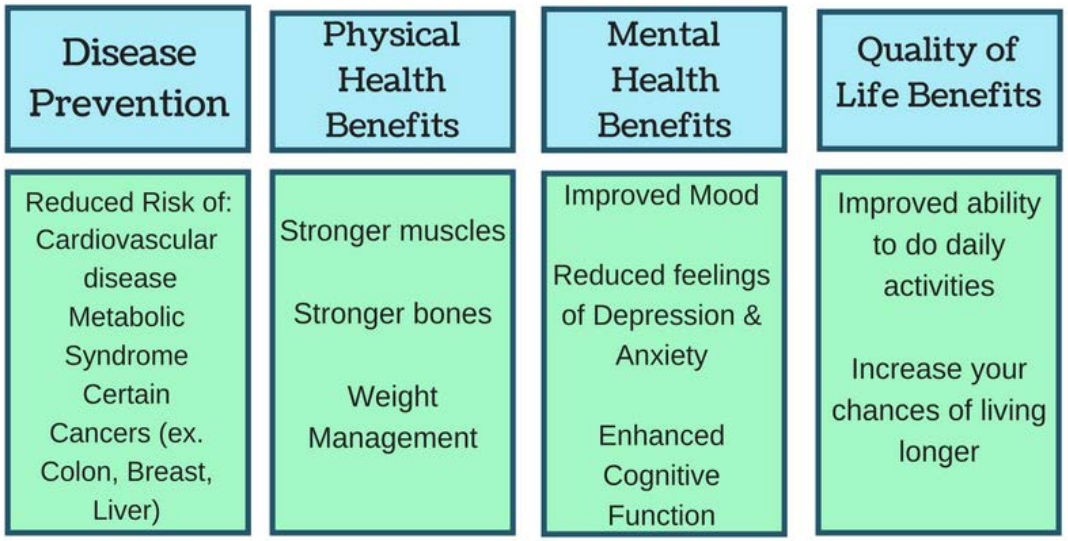
Note that many of the benefits described here, like better health, strengthening relationships, and weight control, are benefits that you can experience once you've been active for a little while.

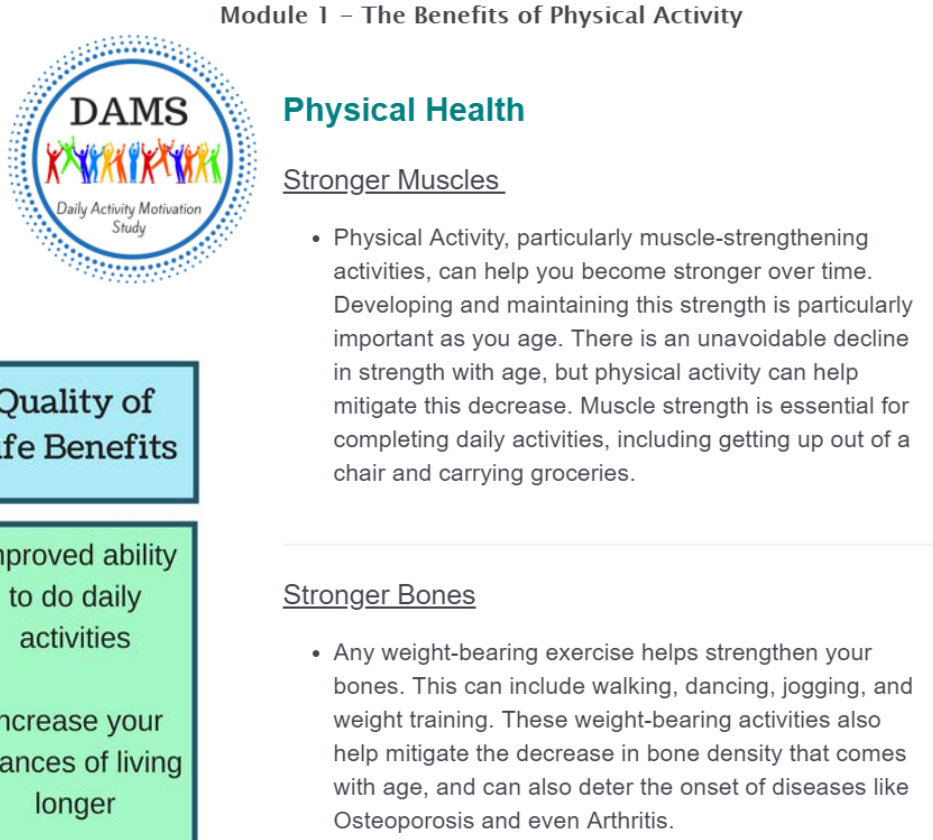
However, there are also many benefits on this list that you could experience if you were to be active TODAY. Some of these include:

- Meeting new people
- Feeling more energetic
- Lower tension and anger
- Increased time spent with family and friends
- Sleeping better

What are some immediate, short-term benefits you have experienced (or believe you would experience) if you were active today?

Example: Control Module 1





Program Evaluation

- Quantitative
  - 5 items
  - *(*1 = *Strongly Disagree; 5 = Strongly Agree)*

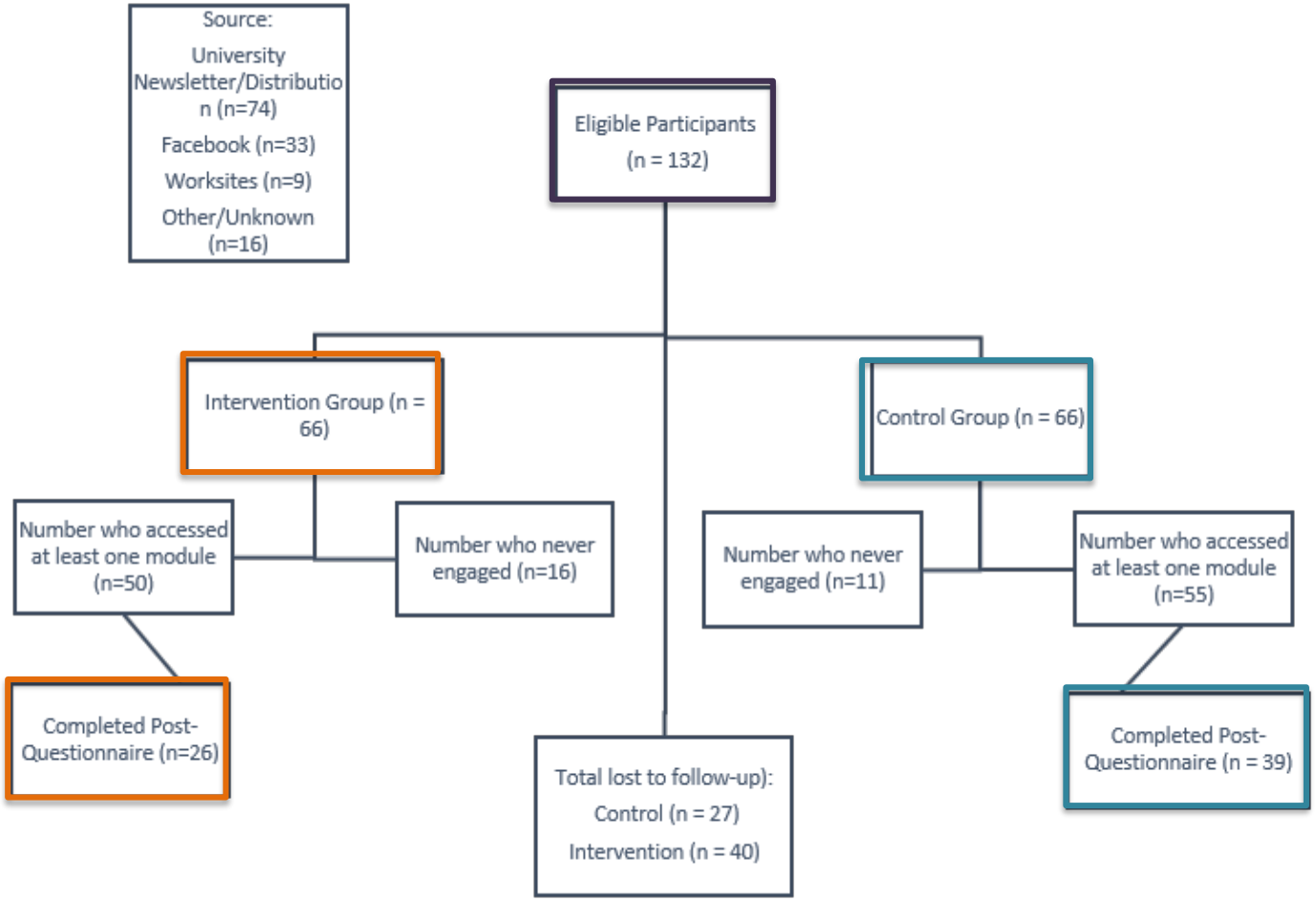
Program Evaluation

- Qualitative: 4 open-ended questions
  - *"Did participating in the study increase your motivation to be active on a daily basis? Why or why not?"*
  - *"What additional information would you have liked to see included?"*
  - *"Any suggestions on how the modules could be improved?"*
  - *"Do you have any final thoughts/comments on the DAMS study?"*

Demographics

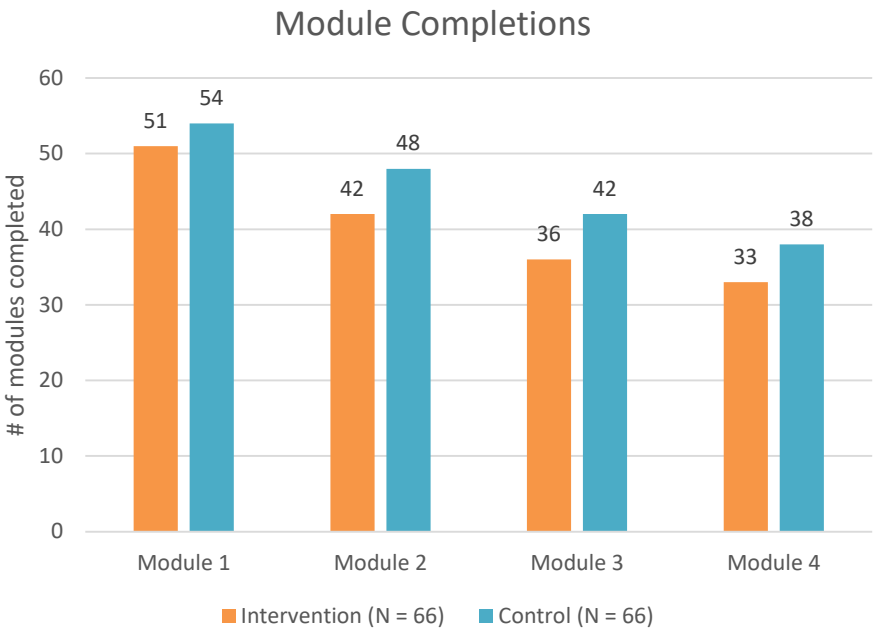
Variable	All (n=132) N (%)	Intervention (n=66) N (%)	Control (n=66) N (%)
Stage of Change			
Stage 2 (Contemplation)	36 (27%)	21 (32%)	15 (23%)
Stage 3 (Preparation)	96 (73%)	45 (68%)	51 (77%)
Female	109 (83%)	53 (80%)	56 (85%)
White	116 (88%)	56 (85%)	60 (91%)
College-educated (above Bachelor's)	116 (87%)	55 (83%)	61 (92%)
Married	70 (53%)	30 (45%)	40 (61%)
Children (>1)	64 (48%)	34 (52%)	30 (45%)
Income >$50,000	69 (52%)	33 (50%)	36 (55%)

Participant Retention



Participant Retention between groups

- Significant dropout over 4 weeks for both groups
  - Among those engaged with the intervention after randomization



Measure	Group	Baseline Mean (SD)	Post-Intervention Mean (SD)	N	P-value (Time)	P-value (Group)
Autonomous Motivation	Control	6.781 (5.738)	8.57 (5.099)	n=40	<.001*	.515
	Intervention	6.437 (5.868)	8.928 (5.341)	n=28		
Attitude (Combined)	Control	5.05 (6.13)	6.07 (5.78)	n = 39	.033*	.881
	Intervention	3.82 (5.42)	5 (4.77)	n = 28		
PBC	Control	15.65 (4.19)	17.67 (3.54)	n = 40	.002*	.206
	Intervention	17.75 (3.56)	18.6 (2.64)	n = 28		
Exercise Identity	Control	29.84 (9.466)	31.82 (11.53)	n = 39	.079	.835
	Intervention	30.67 (11.31)	33.036 (12.468)	n = 28		
Intention (# days)	Control	3.23 (1.24)	3.3 (1.3)	n = 39	.448	.763
	Intervention	3.28 (1.18)	3.46 (.83)	n = 28		
Physical Activity (MET-hours)	Control	13.44 (12.57)	17.91 (15.99)	n = 37	.154	.514
	Intervention	18.59 (16.25)	20.25 (13.78)	n = 24		

Program Evaluation Results

- Overall: moderate-high & positive
  - Highest rating for module length

Question	Control Mean (SD)	Intervention Mean (SD)
The DAMS Study increased my motivation to be physically active	3.62 (0.711)	3.58 (0.703)
The content of the DAMS Study was relevant to me	4.13 (0.732)	4.12 (0.653)
The online modules were an effective way to deliver the content	4.05 (0.826)	4.15 (0.675)
The length of the modules was appropriate	4.33 (0.701)	4.35 (0.562)
I would recommend participating in the DAMS Study to others	3.77 (0.872)	3.96 (0.916)

Results – Qualitative Evaluation

Discussion

- Purpose of DAMS Study was to see if interactive modules would have greater impact on psychological variables & physical activity compared to information-based
- Hypothesis was not supported – no differences between groups
  - But were significant increases in autonomous motivation, overall attitude, & perceived behavioral control over time
- No significant change in physical activity

Lack of Differences between Groups

- Unexpected improvements in control group
  - Education-based interventions typically not as effective
- Possible explanations:
  - Some re-framed content was presented to control group
    - Reflected what was available on CDC website

Sherwood & Jeffrey, 2000; Silva et. al, 2010

Online intervention strategy

- Feasible strategy to deliver autonomy-supportive content and shift attitudes
- Encountered challenges with recruitment and retention
- Future research should investigate how to recruit more diverse participants and increase engagement to promote program adherence

Minimum Intervention Duration

- Saw changes in key psychological factors after 4-week intervention
- Likely not enough time to be translated to physical activity behavior
- Future studies should incorporate longer post-intervention follow-ups to assess if psychological changes are translated into physical activity

Strengths

- Developed an online SDT-based autonomy supportive intervention
- Few previous 4-week interventions
- Re-defined physical activity
  - Focus on internal motives
  - Immediate rewards
  - ‘Everything counts’

Limitations

- Small, non-representative sample
- Self-reported data
- 4-week intervention may not be enough for a sustainable change
- Inadequate time to test & refine modules before implementation

Future Directions

- Identify strategies to recruit a more diverse sample, particularly males
- Increase interaction between weekly module delivery
- Longer-term follow-up
  - Sustainability of psychological changes
  - Translation to PA behavior

Overall Conclusions

- Changing the conversation regarding physical activity to support key psychological needs can be an effective strategy for physical activity behavior change
- Online modules a promising strategy
- Psychological needs must be met for a sustained change in physical activity
  - Sustainable changes are essential in order to address the inactivity crisis

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MPH FIELD EXPERIENCE REPORT

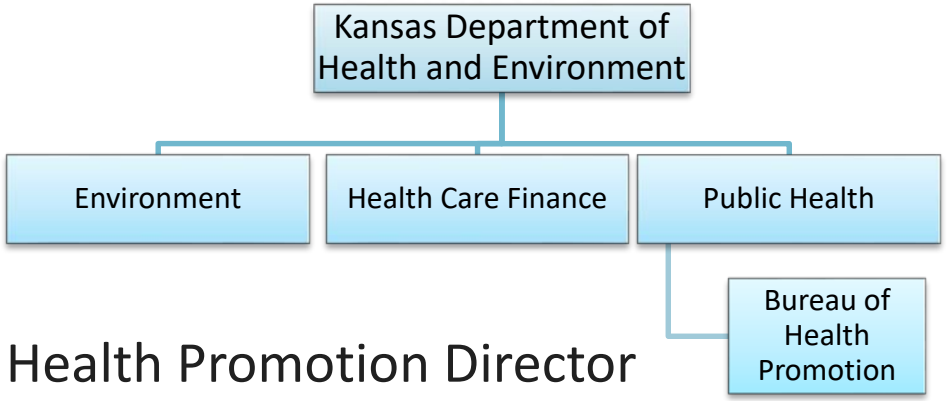
Kansas Department of Health and Environment

Bureau of Health Promotion

Topeka, Kansas

Summer 2017

Overview



- Preceptors:
  - Jennifer Church – Community Health Promotion Director
  - Warren Hays – Physical Activity & Nutrition (PAN) Manager
- Completed tasks related to:
  - Farmers Markets
  - Grant Management
  - Internal Communication
  - Evaluation/External Communication
- Fulfillment of MPH Core Competencies

Theme 1: Farmers Markets

- Capitol Midweek Farmers Market
  - Set up, supervised, and cleaned up manager's table and signs
  - Interacted with market customers and farmers
  - Created & distributed weekly promotional materials

Farmer's Market Flyer & Radio Spot

Every Wednesday, 7:30 a.m. - 12:30 p.m. @ 10th Avenue between Jackson and Harrison

CAPITOL MIDWEEK

Farmers Market

11 Years of Fresh in the Capital City

Featured Produce of the Week:

Watermelon

Watermelon Recipes:

Step 1: Slice the watermelon

Step 2: Enjoy!

- Watermelon Berry Popsicles
- Watermelon Smoothie
- Watermelon-infused water
- Minty Lime Watermelon Slices
- Watermelon Peach Spritzer
- Agua Fresca

You could also serve the drinks in a watermelon keg! Click here to learn how.

Fresh on August 9

Watermelon, Cantaloupe, Cucumbers, Eggplant, Okra, Peppers, Potatoes, Sweet Corn, Onions, Squash, Tomatoes, Tomatillos, & Zucchini

Special Guest:

Topeka365

Visit Topeka will be promoting Cyclovia Topeka and other upcoming events around the city

Watermelon Facts:

Key Nutrients:

- Vitamins A & C

A good watermelon:

- Is firm, and symmetrical
- Feels heavy for its size
- Should sound hollow when knocked on
- Has a smooth and slightly dull rind

Storage:

- Uncut watermelon — best if stored between 50°-60°
  - Keep away from ethylene-producing foods (ex. Apples, peaches, pears)
- Cut watermelon — keep refrigerated in an airtight container; typically good for 3-5 days

For more information about the health benefits of watermelon, Click Here

Sponsored by the Kansas Department of Health and Environment Bureau of Health Promotion.
http://www.kdheks.gov/bhp/farmers_market/index.htm

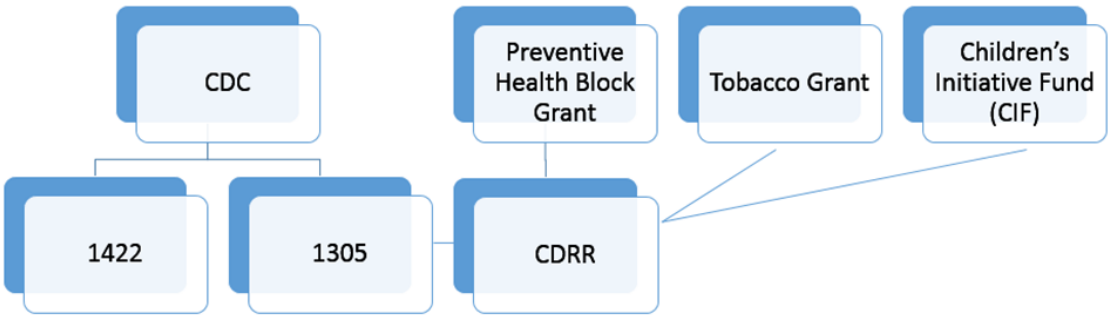
Theme 1: Farmers Markets cont'd

- Kansas Senior Farmers Market Nutrition Program (KSFMNP)
  - Check distribution tracking
  - Postcards for farmer renewal reminders

Theme 2: Grant Management

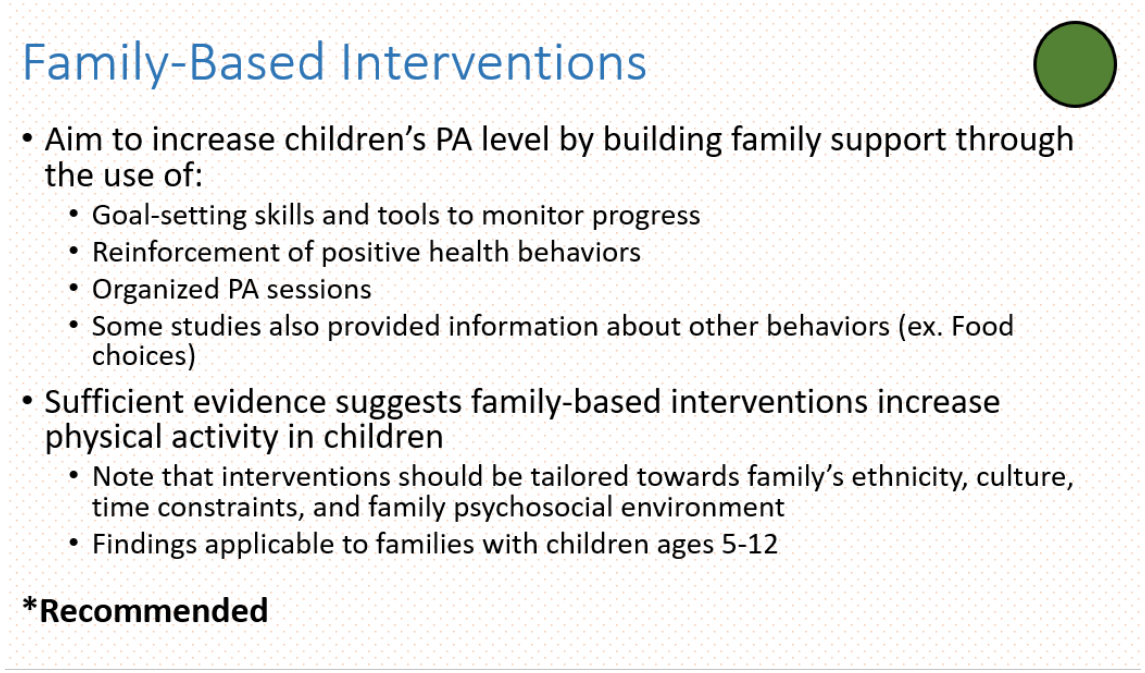
- Chronic Disease Risk Reduction (CDRR) – FY18 spreadsheet
  - Number of communities working on each strategy
  - Tactics to complete each selected strategy

KDHE FY18 Grant Flowchart



Theme 3: Internal Communication

- The Community Guide GoTo Presentation
  - Delivered to 5 KDHE employees on August 10, 2017



Theme 4: Evaluation + External Communication

- Farmers Market Workshops
  - Synthesized feedback from 4 workshops
- Healthy Kansas School Key Informant Interviews
  - Analyzed results of phone interviews with 8 school districts
- Provided written summary of findings for annual CDC report

CONNECTION TO MPH CORE COMPETENCIES

Public Health

Prevent.Promote.Protect.

Competency 1 -

Interpret results of data analysis for public health research, policy or practice

<u>Evidence of Completion:</u>

- Farmers market workshop evaluations
- Key informant interview evaluations

Competency 2 -

Select Communication strategies for different audiences/sectors

Evidence of Completion:

- Promotional materials for Capitol Midweek Farmers Market
  - Flyers & radio spots
- GoTo Meeting for KDHE employees

Competency 3 -

Communicate audience-appropriate public health content, both in writing and through oral presentation

Evidence of Completion:

- Written
  - Grant evaluation summaries
  - CDRR strategies spreadsheet
- Verbal
  - Community Guide presentation

Competency 4 -

Perform effectively on interprofessional teams

Evidence of Completion:

- Worked with 2 preceptors on various projects
- Completed tasks assigned by the Epidemiologist for data tracking and reporting
- Assisted with other areas around BHP

Competency 5 -

Apply systems thinking tools to a public health issue

Evidence of Completion:

- KSFMNP distribution through local senior organizations
- KSFMNP farmer reminder postcard distribution

Field Experience Takeaways

- Experience at KDHE enhanced understanding of public health as a whole
  - Worked with program implementation
  - Interacted with community members
  - Completed program evaluations and identified areas for future improvement
- Overall gained quality skills and experience that can be translated to future public health career

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THANK YOU!

QUESTIONS?