Longitudinal Outcomes and Predictors of E-Learning Effectiveness in Patients with Axial Spondyloarthritis: A Randomized Controlled Trial

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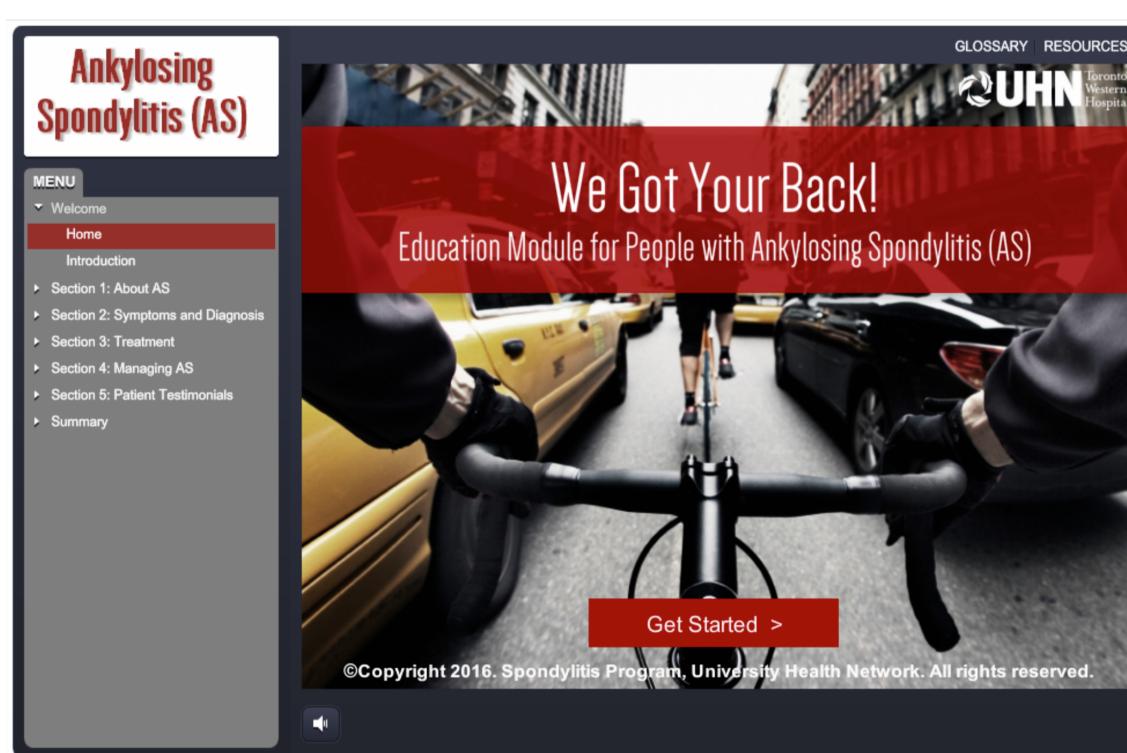
INTRODUCTION

- There is evidence that education programs are effective (e.g. improved disease activity and quality of life) for patients with arthritis[1].
- Little is known about the impact of education interventions in axial spondyloarthritis (axSpA).

OBJECTIVES

To determine a) the impact of an e-Learning education program on patients' disease knowledge and self-efficacy, and b) the predictors associated with better self-management.

METHODS

- The Toronto Western Hospital Spondylitis Program developed an interactive, e-Learning education program for axSpA[2].
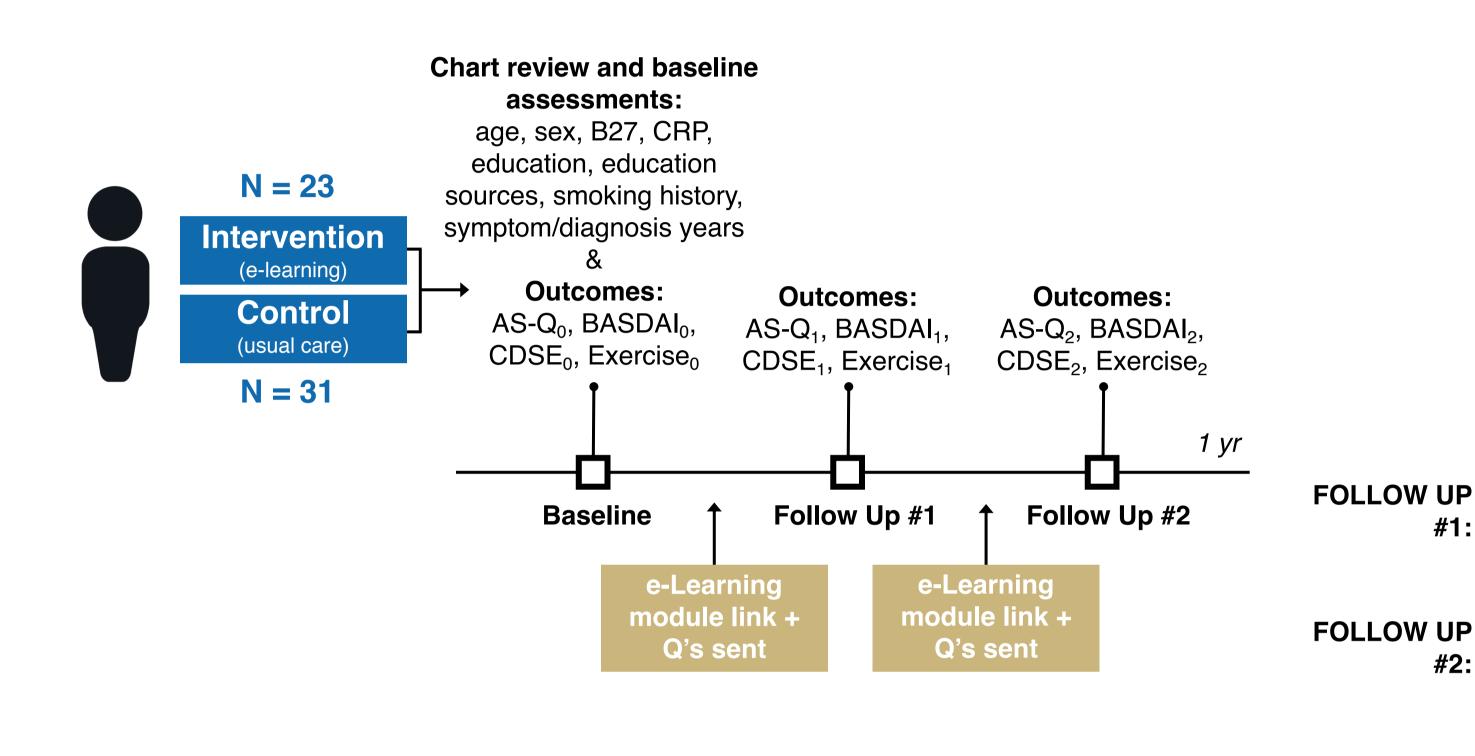

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- **Allocation:** Adult axSpA patients were randomly allocated 1:1 to either the intervention (e-Learning with usual care) or control (usual care) group.
- **Outcomes:** 1) Bath Ankylosing Spondylitis Disease Activity Index (BASDAI)
  2) Ankylosing Spondylitis Knowledge (AS-Q) questionnaire
  3) Stanford Exercise scale
  4) Stanford Chronic Disease Self-Efficacy (CDSE) scale
- **Data collection:** baseline (BL), first follow-up (FU1), and second follow-up (FU2) 6-12 months after FU1.
- **Data analysis:** A linear-based generalized estimating equation was used to explore the associations between covariates including group, socio-demographic characteristics, and risk factors for poor disease outcomes.

RESULTS

Figure 1. Study timeline.

Figure 2. Study flowchart.

Table 1. Baseline demographics and disease characteristics.

DEMOGRAPHIC or RISK FACTOR	N	Control (N = 31)	Min	Max	Intervention (N = 23)	Min	Max
Age, y (mean, SD)	54	40.9 (12.1)	23	68	43.2 (13.8)	23	70
Diagnosis (AS)	54	25 (80.6)			19 (82.6)		
Males (n, %)	54	22 (71.0)			17 (73.9)		
Smoker ever (n, %)	54	7 (22.6)			4 (17.4)		
HLA-B27+ (n, %)	54	24 (77.4)			20 (87.0)		
Education level	51	85.2% completed college or university					
high school (n, %)		3 (9.7)			2 (8.7)		
college (n, %)		4 (12.9)			2 (8.7)		
university (n, %)		23 (74.2)			17 (73.9)		
Education sources (median, IQR)	54	3 (2, 3)	1	5	3 (2, 3)	1	5
Symptoms, y (mean, SD)	52	17.3 (10.4)	1	38	18.4 (11.3)	3	44
Diagnosis, y (mean, SD)	54	10.4 (8.9)	1	37	15.0 (10.9)	0	39
CRP, mg/L (mean, SD)	52	6.3 (8.7)	3	48	4.6 (3.6)	1	16
ESR, mm/hr (mean, SD)	52	11.5 (12.7)	1	60	6.4 (5.8)	1	22

% = proportion of participants. IQR = interquartile range. n = sample size. SD = standard deviation. y = years.

Table 2. Parameter estimates for outcomes.

AS-Q Predictor	Coefficient (β)	95% Wald CI		P	Trend
Education sources = 3	3.88	0.79	6.98	0.014	↑
Education sources = 4	4.87	1.63	8.10	< 0.01	↑
Education sources = 5	6.84	3.73	9.94	< 0.01	↑
Control • time	0.85	0.18	1.52	< 0.01	↑
Exercise (aerobic)					
Education sources = 5	147.90	64.61	231.18	< 0.01	↑
Female	-53.21	-101.73	-4.69	0.03	↓
Exercise (stretch)					
Education sources = 3	47.77	14.81	80.72	< 0.01	↑
Education sources = 4	56.17	18.18	94.17	< 0.01	↑
CDSE (get information about disease)					
Education sources = 3	-1.75	-3.32	-0.18	0.029	↓
Education sources = 4	-2.68	-4.62	-0.75	< 0.01	↓

CDSE (get help from family/friends) Predictor	Coefficient (β)	95% Wald CI		P	Trend
Education sources = 5	2.75	1.27	4.22	< 0.01	↑
Intervention	1.32	0.26	2.38	0.015	↑
CDSE (communicate with physician)					
Symptoms >10y	1.01	0.33	1.69	< 0.01	↑
CDSE (manage disease)					
Female	0.90	0	1.81	0.050	↑
Symptoms >10y	1.18	0.20	2.16	0.018	↑
CDSE (manage depression)					
Symptoms >10y	1.52	-0.074	3.12	0.062	—

Figure 3. AS-Q response over time.

↑ in AS-Q disease knowledge over time (ceiling effect) for all groups (p = 0.043)

Study Limitations:
- Powered for n = 32 per group with many LFUs, particularly at FU#2.
- Challenges with remote data collection via online survey.
- Access frequency was unknown due to portal access setup.

CONCLUSIONS

- This e-Learning module shows promising efficacy in improving disease knowledge and health literacy behaviours.
- Although there were few observed differences between groups, this might suggest that care at a specialized, tertiary centre is sufficient in adequately educating patients about managing their disease. This platform serves to benefit individuals with limited access to specialized, tertiary care.
- There is a need for more trials to assess more effective education strategies and outcomes, and future studies should include predictors and risk factors (e.g. sex, previous education sources, symptom duration) that were shown to be meaningful in this analysis.

References
1. Vliet, V.T.P. (2004). Multidisciplinary team care and outcomes in rheumatoid arthritis. Curr Opin Rheumatol 16(2):153-156.
2. We Got Your Back! Education Module for People with Ankylosing Spondylitis. 2016. Spondylitis Program, University Health Network. [ONLINE] Available at: www.wegotyourbacktwh.ca