Health Literacy Assessment of University Employees Using the Newest Vital Sign (NVS) Tool

THE OHIO STATE UNIVERSITY
COLLEGE OF NURSING

Joyce Karl, DNP, CRNP, ANP-BC, COHN-S and Jodi McDaniel, PhD, RN

Purpose

The purpose of this project was to assess baseline levels of health literacy in a sample of Ohio State University (OSU) employees.

Background/Significance

Health literacy (HL): the ability to obtain, process, communicate, and understand basic health information and services in order to make appropriate health decisions[1]

HL is a stronger predictor of health status than age, income, race, ethnicity, education level or employment status [2]

• 9 out of 10 adults have difficulty using routinely available health information[2]

Number of US Adults in Each Literacy Level
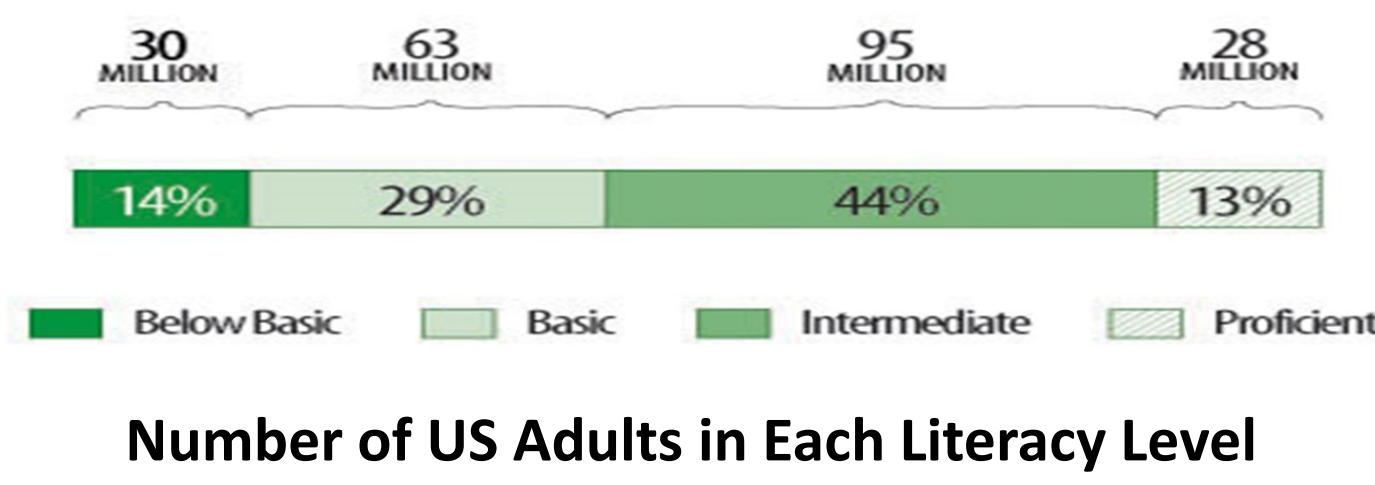
• Low literacy associated with:
- More hospitalizations
- More frequent use of emergency care
- Lower rate of mammography screening
- Lower rate of influenza vaccination
- Poorer ability to demonstrate taking medications appropriately
- Poorer ability to interpret labels and health messages

And among older adults:
- Poorer overall health status
- Higher mortality and readmission rates

And among workers:
- Higher risk for injuries, illnesses, and fatalities[3]

Design

• Observational, cross-sectional design

Procedures/Measures

• Verbal consent, demographic data, tool administered and timed

Sample/Setting

• Convenience sample (volunteers)
• N = 120 new and existing OSU employees (≥ 18 years of age) visiting UHS for onboarding, medical surveillance, or non-urgent routine care
• Outpatient clinic for employee/ occupational health and primary/urgent care (central campus)

Instrument: NVS Tool [4,5]

• Six-question screening tool
• Identifies risk for limited health literacy
• Based on interpreting ice cream nutrition label
• Can be administered in ~ 3 minutes
• Reliability: Cronbach's α = 0.76; Criterion Validity: r = 0.59 compared with established Test of Functional Health Literacy Assessment (TOFHLA) tool.

NVS Nutrition Label
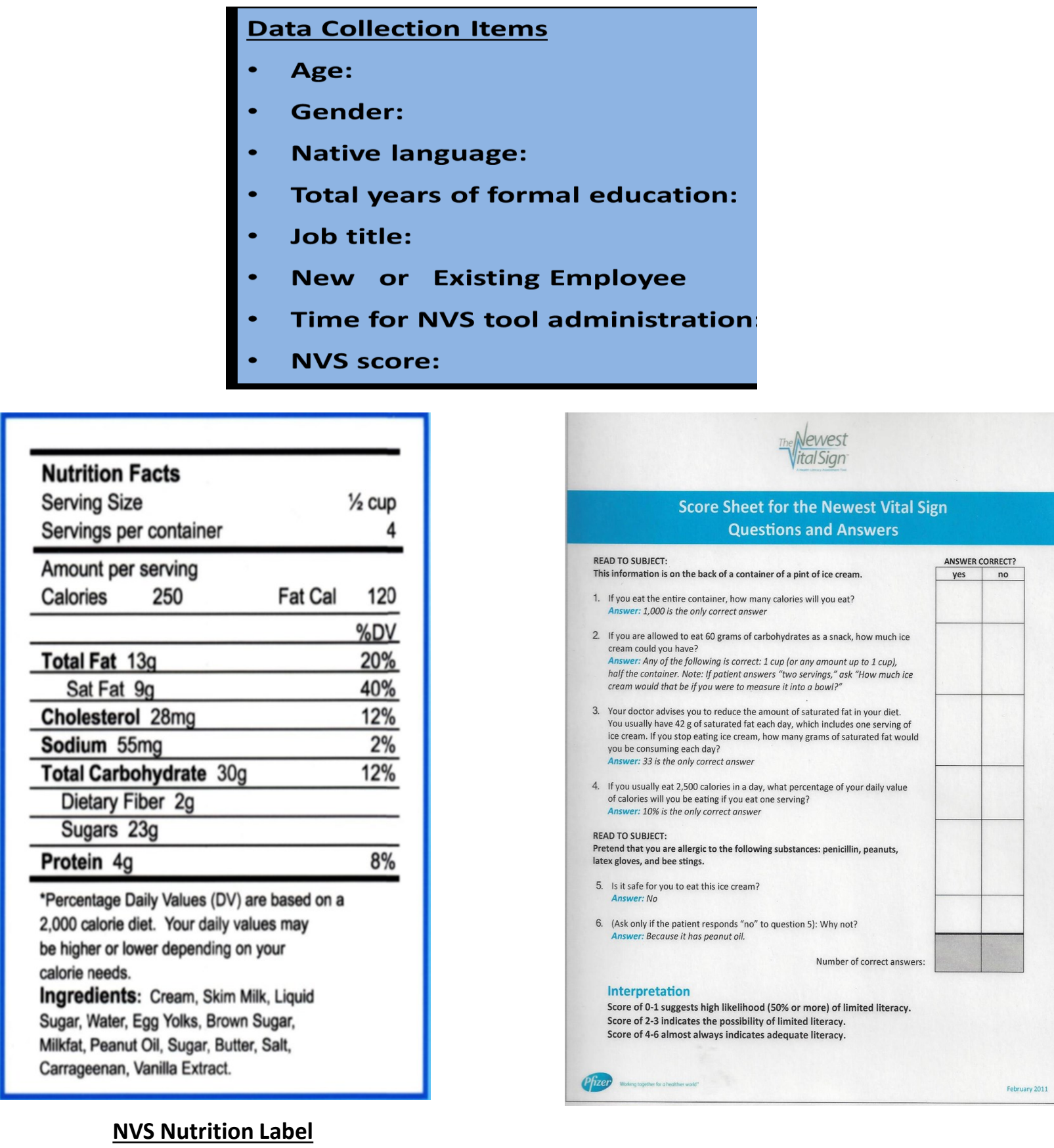
Findings

Distribution of age, NVS score, education level, and time to complete NVS

	N	Mean	SD	Median	Minimum	Maximum
Age	120	36.73	13.31	34.00	19.00	74.00
NVS Score	120	4.76	1.32	5.00	0.00	6.00
Education (years)	120	16.62	2.60	16.00	12.00	24.00
Time (minutes)	119	1.97	0.55	1.94	1.07	3.35

Note. SD = standard deviation

Mean NVS score (4.76) indicates "Likely Adequate" HL
Mean time to administer NVS tool (1.97 min); feasible in clinical practice

Findings

Socio-demographic Characteristics of Sample

Characteristic	(n = 120)	
Age, mean (SD), years	36.73 (13.31)	Range (19 – 74)
Gender, n (%)		
Male	56 (46.67%)	
Female	64 (53.33%)	
Native language, n (%)		
Non-English	13 (10.83%)	
English	107 (89.17%)	
Education, formal, mean (SD), years	16.6 (2.60)	Range (12 – 24)
Job title, n (%)		
Medical	52 (43.33%)	
Non-medical	68 (56.67%)	
Employment status, n (%)		
New	23 (19.17%)	
Existing	97 (80.83%)	

Distribution of NVS score and Score Classifications

	N	%
NVS Score		
0	2	1.67
1	1	0.83
2	4	3.33
3	13	10.83
4	19	15.83
5	39	32.50
6	42	35.00
Score Classification		
Limited (0-1)	3	2.50
Possibly Limited (2-3)	17	14.17
Likely Adequate (4-6)	100	83.33

Most participants (83%) had "Likely Adequate" NVS scores, but, 17% had "Limited" or "Possibly Limited" NVS scores

Language Differences of On-Ave. Groups Differences in NVS Score and Time

Variable	Sample Size	Overall Mean (STD)	Not English		English		Difference Between Means (95% CI)	P Value	Effect Size (Cohen's d)
			N	Mean (STD)	N	Mean (STD)			
NVS Score	120	4.8 (1.3)	13	3.8 (1.2)	107	4.9 (1.3)	-1.1 (-1.9,-0.4)	<0.01**	0.9**
Time on NVS	119*	2 (0.5)	13	2.4 (0.6)	106	1.9 (0.5)	0.5 (0.1, 0.8)	<0.01**	0.9**

* one participant was legally blind and was unable to read the label for NVS tool administration

Non-English native language participants had lower NVS scores and took a longer time to complete the tool than English native language participants

Findings

Pearson product-moment Correlations between Score, Time, Age, and Education

Variable	NVS Score	Time (min.)	Age	Education
NVS Score	1			
Time to complete	-0.43***	1		
Age	-0.26**	0.33***	1	
Education years	0.17~	-0.11	0.03	1

Note. N = 120

~ p ≤ .10 * p ≤ .05 ** p ≤ .01 *** p ≤ .001

Lower NVS scores were associated with Non-English native language, older age and longer time to complete the NVS tool

Discussion

• Findings aligned with previous studies
• Recommend adoption of health literacy universal precautions throughout organization [6]
• Mean time for NVS completion was < 2 minutes - feasible in clinical practice
• Everyone can have "situational" health literacy challenges

Implication

• **Nurses are positioned to design and lead patient-centered, evidence-based, strategic initiatives to overcome health literacy challenges for individuals, the health system, and society. [7]**

References

[1] Affordable care act. (2014).
[2] Kutner, M., et al. (2006). *The Health literacy of America's adults: Results from the 2003 national assessment of adult literacy.*
[3] Berkman, N. D. et al. (2011). *Annals of Internal Medicine,* 155(2)
[4] Pfizer Inc. (2011).Newest Vital Sign Toolkit.
[5] Weiss, B.D. et al. (2005). *Annals of Family Medicine* 3(6).
[6] Koh, H. K., et al. (2013). Health Affairs, 32(2).
[7] Cornett, S. (2009). *Online Journal of Issues in Nursing, 14(3).*