



Yet Another Reason to Examine the Nails: Substantial Cancer-Related Worry and Anxiety in Patients With Melanonychia in a Survey-Based Study

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To the Editor,

Longitudinal melanonychia (LM) is a common sign of nail unit melanoma (NUM), often eliciting anxiety and cancer-related worry. We aimed to quantify levels and determine predictors of melanoma-related worry in LM patients.

An Institutional Review Board-approved survey containing demographics, Melanoma Worry Scale (MWS), State-trait Anxiety Inventory (STAI-6), and Revised Impact of Event Survey (RIES) (Supplementary material), was administered 12/25/20-03/1/22, to patients >18 years presenting with LM, pre- and post-nail consultation. Univariate analysis determined factors affecting baseline MWS scores. Multivariate analysis determined independent predictors of baseline MWS scores ($\alpha = 0.05$).

Forty-eight patients (82%) completed surveys; mean age 51 years and 71% women. Mean baseline MWS and

STAI-6 scores were 10/17 and 47/80, respectively (Table 1). Post-consultation, mean MWS and STAI-6 scores decreased by 4.6 and 16.3 points, respectively ($P < 0.001$ all), for patients for whom biopsy was not recommended ($N = 30$) (Table 2). Median baseline RIES scores for avoidance and intrusion subscales were 4/40 and 3/35, respectively. Internet searches ($\beta=1, P=0.01$), personal history of psychiatric illness ($\beta=1.1, P=0.02$), personal history of melanoma ($\beta=1.6, P=0.02$), and higher STAI-6 scores ($\beta=0.1, P<0.001$) independently predicted baseline MWS scores on multivariate analysis.

Univariate analysis of change in MWS scores in the no-biopsy group showed that female sex, seeing dermatologist versus other clinician, internet searching, personal history of psychiatric illness, and higher baseline STAI-6 scores were associated with greater decrease in MWS scores post-consultation ($P<0.05$ all).

Table 1. Correlation of baseline melanoma-related worry (MWS scores) with sociodemographic characteristics, baseline State-trait Anxiety Inventory (STAI-6) and Revised Impact of Event Survey (RIES) scores.

Variables		N (%) and mean± SD / median (Range)	MWS score, mean ± SD	P-value
Age, year		51.1 ± 15.4		0.94
Sex	Female	34 (70.8)	10.6 ± 2.8	0.02 ^a
	Male	14 (29.2)	8.2 ± 3.1	
Race	White	30 (62.5)	10 ± 3.1	0.69 ^b
	Black	8 (16.7)	8.9 ± 2.4	
	Asian	6 (12.5)	10.8 ± 2.6	
	Other	4 (8.3)	10 ± 5	
Ethnicity	Hispanic/Latino(a)	5 (10.4)	9 ± 4.5	0.38 ^b
	Not Hispanic/Latino(a)	41 (85.4)	10.2 ± 2.9	
	Prefer not to answer	2 (4.2)	7.5 ± 0.7	
Do you have children?	Yes	26 (54.2)	10 ± 2.8	0.95 ^a
	No	22 (45.8)	10 ± 3.4	
Marital status	Married	30 (62.5)	9.9 ± 2.9	0.47 ^b
	Single	12 (25)	9.3 ± 3.4	
	Divorced	5 (10.4)	11.6 ± 2.7	
	Widowed	1 (2.1)	12	
Education	Any college or higher degree	42 (87.5)	10.4 ± 2.9	0.001 ^a
	Less than a college degree	6 (12.5)	7 ± 2.1	
Employment	Employed	35 (72.9)	10.1 ± 3	0.53 ^a
	Unemployed	13 (27.1)	9.5 ± 3.2	
Household income, yearly (United States Dollar)	<\$10,000	1 (2.1)	4	0.37 ^b
	\$10,000-\$49,999	1 (2.1)	10	
	\$50,000-\$74,999	5 (10.4)	10.8 ± 2.9	
	\$75,000-\$100,000	5 (10.4)	10 ± 3.9	
	>\$100,000	29 (60.4)	9.7 ± 2.9	
	I prefer not to answer	7 (14.6)	11.1 ± 3	
Have you ever seen a physician for this?	Yes	42 (87.5)	9.7 ± 3	0.16 ^a
	No	6 (12.5)	11.7 ± 2.8	
What kind of clinician? (N = 42)	Dermatologist	35 (83.3)	10.1 ± 3	0.01 ^a
	Other type of clinician	7 (16.7)	7.6 ± 1.9	
Have you searched the internet for melanonychia-related information?	Yes	38 (79.2)	10.7 ± 2.8	<0.001 ^a
	No	10 (20.8)	7.1 ± 2.3	
Did you diagnose yourself using information from the internet? (N = 38)	Yes	9 (23.7)	10.1 ± 3	0.52 ^a
	No	29 (76.3)	10.9 ± 2.7	
Have you ever been diagnosed with a psychiatric condition?	Yes	6 (12.5)	12.2 ± 1.3	0.003 ^a
	No	42 (87.5)	9.6 ± 3.1	
Have you ever been diagnosed with melanoma?	Yes	3 (6.25)	15 ± 2	0.03 ^a
	No	45 (93.75)	9.6 ± 2.8	

Do you have a family history of melanoma?	Yes	7 (14.6)	10.6 ± 5	0.71 ^a
	No	41 (85.4)	9.8 ± 2.7	
STAI-6		46.6 ± 14.9		<0.001
RIES	Avoidance subscale	4 (0-26) ^c		0.31
	Intrusion subscale	3 (0-21) ^c		.16

ANOVA = analysis of variance; MWS = Melanoma Worry Scale; RIES = Revised Impact of Event Survey; SD = standard deviation; STAI-6 = State-trait Anxiety Inventory.

^aTwo sample t-test

^bANOVA test

^cMedian (range)

Table 2. Pre- and post-consultation survey results

Survey	Mean/Median score (Range)						
	Pre-test	Pre-consultation		Post-consultation			
	All (N = 48)	Biopsy not recommended (N = 30)	Biopsy recommended (N = 18)	Biopsy not recommended (N = 30)	P-value	Biopsy recommended (N = 18)	P-value ^a
MWS (range, 4-17)	9.9 ^c (4-17)	10 ^c (4-15)	9.8 ^c (5-17)	5.4 ^c (4-10)	<0.0001	9.9 ^c (5-15)	0.89
How much do you worry about getting nail melanoma? (range, 1-5)	3 (1-5)	3 (1-5)	3 (1-5)	1 (1-5)		3 (1-5)	
How much does worrying about developing nail melanoma impact your mood? (range, 1-4)	2 (1-4)	2 (1-4)	2 (1-4)	1 (1-3)		2 (1-4)	
How much does worrying about developing nail melanoma impact. Your daily activities? (range, 1-4)	2 (1-4)	2 (1-4)	1 (1-4)	1 (1-3)		2 (1-4)	
What is your current level of anxiety about the results of your nail examination? (range, 1-4)	3 (1-4)	3 (1-4)	3 (1-4)	1 (1-4)		4 (1-4)	
STAI-6 (range, 20-80)	46.6 ^c (20-77)	47 ^c (20-77)	45.9 ^c (20-77)	30.7 ^c (20-56.6)	<0.0001	48.1 ^c (12-70)	0.6
I feel calm (range, 1-4)	3 (1-4)	3 (1-4)	2 (1-4)	1 (1-4)		3 (1-4)	
I am tense (range, 1-4)	2 (1-4)	2 (1-4)	2 (1-4)	1 (1-4)		2 (1-3)	
I feel upset (range, 1-4)	1 (1-4)	2 (1-4)	1 (1-3)	1 (1-4)		1 (1-3)	
I am relaxed (range, 1-4)	3 (1-4)	3 (1-4)	3 (1-4)	1 (1-4)		3 (1-4)	
I feel content (range, 1-4)	3 (1-4)	3 (1-4)	2.5 (1-4)	1 (1-4)		3 (1-4)	
I am worried (range, 1-4)	2 (1-4)	2 (1-4)	2 (1-4)	1 (1-4)		3 (1-4)	
RIES							
Avoidance subscale (range, 0-40)	4 (0-26)	3 (0-26)	6.5 (0-22)				
Intrusion subscale (range, 0-35)	3 (0-21)	2 (0-21)	4.5 (0-10)				

MWS = Melanoma Worry Scale; STAI-6 = State-trait Anxiety Inventory. RIES = revised Impact of Event Survey.

^cMean

^aP-value obtained from paired t-test.

Our study showed that LM patients experience substantial levels of baseline melanoma-related worry and anxiety, with internet searching, psychiatric illness, personal history of melanoma, and higher baseline STAI-6 scores predicting higher baseline worry levels. Similar MWS scores (median 8/17) were reported in a survey-based study of 138 patients with atypical mole syndrome undergoing total-body digital photography [1]. In a survey-based study of 324 patients with pigmented lesions, mean STAI-6 scores for those needing skin biopsy vs. not were 13/26 and 11/26, respectively [2]. We found no significant differences in baseline MWS or STAI-6 levels between biopsy/no-biopsy groups, potentially indicating decreased LM awareness. MWS scores in LM patients with favorable findings were reduced to negligible following consultation. Nail examinations are likely underutilized, with only 18.2% of dermatologists performing them, and 68% of resident dermatologists “not confident” in assessing melanonychia, in a survey-based study of 402 dermatologists [3].

Cancer-related worry promotes screening behaviors [4]; however, irrational fear can be detrimental. In a bibliographic analysis of NUM-related online material, reliability was low, with only 22% of websites meeting accepted seventh-grade reading level [5]. Since internet searching correlates with baseline melanoma worry, increased accuracy and readability of NUM-related online material may improve psychological outcomes for LM patients.

Limitations include small sample size, short follow-up, potential selection bias due to tertiary referral site, reporting bias, and using an adopted non-melanoma specific worry scale.

To our knowledge, this is the first study assessing psychological distress in LM patients. We show benefit of nail evaluation on patients psychological wellbeing. We hope our study will spur dermatologists to regularly perform nail examinations data and encourage community efforts to improve accuracy and readability of NUM educational materials.

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