

“I’m healthy, I don’t have pain”- health screening participation and its association with chronic pain in a low socioeconomic status Singaporean population

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Background: We sought to determine the association between chronic pain and participating in routine health screening in a low socioeconomic-status (SES) rental-flat community in Singapore. In Singapore, ≥ 85% own homes; public rental flats are reserved for those with low-income.

Methods: Chronic pain was defined as pain ≥ 3 months. From 2009–2014, residents aged 40–60 years in five public rental-flat enclaves were surveyed for chronic pain; participation in health screening was also measured. We compared them to residents staying in adjacent owner-occupied public housing. We also conducted a qualitative study to better understand the relationship between chronic pain and health screening participation amongst residents in these low-SES enclaves.

Results: In the rental-flat population, chronic pain was associated with higher participation in screening for diabetes (aOR = 2.11, CI = 1.36–3.27, $P < 0.001$), dyslipidemia (aOR = 2.06, CI = 1.25–3.39, $P = 0.005$), colorectal cancer (aOR = 2.28, CI = 1.18–4.40, $P = 0.014$), cervical cancer (aOR = 2.65, CI = 1.34–5.23, $P = 0.005$) and breast cancer (aOR = 3.52, CI = 1.94–6.41, $P < 0.001$); this association was not present in the owner-occupied population. Three main themes emerged from our qualitative analysis of the link between chronic pain and screening participation: pain as an association of “major illness”; screening as a search for answers to pain; and labelling pain as an end in itself.

Conclusions: Chronic pain was associated with higher cardiovascular and cancer screening participation in the low-SES population. In low-SES populations with limited access to pain management services, chronic pain issues may surface during routine health screening. (Korean J Pain 2017; 30: 34-43)

Key Words: Asian; Chronic pain; Health screening; Low-income; Mixed methods; Qualitative.

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INTRODUCTION

Chronic pain can contribute to increased healthcare utilization [1], with increased pain severity and disability associated with help-seeking behavior [2–4]. Sufferers from chronic pain perceive healthcare utilization as an alternative coping strategy for their pain [5,6]. Socioeconomic status (SES) and chronic pain are closely linked, with lower individual-SES associated with higher frequency of chronic pain [7,8]. Staying in a low-SES area is also independently associated with chronic pain [9,10]; perhaps because living in less socially cohesive neighborhoods interacts with psychological factors known to increase chronic pain [11]. However, low SES is also associated with disparities in access to health services. In low-SES areas with poorer access to adequate pain management services, patients may turn to other services as an alternative source of solutions for their pain issues.

Singapore is an urbanized, multi-ethnic Asian society. Locally, the prevalence of chronic pain was 8.7% in a 2009 study [12]. Those with chronic pain were less likely to be employed, and have lower education [12,13]. In Singapore, the main area-level indicator of SES in Singapore is home ownership. The majority of Singaporeans ($\geq 85\%$) stay in owner-occupied public housing and due to government subsidies, home ownership is high (90.3%) [14]. Public rental flats provide heavily subsidized rentals (S\$26–S\$275/month) for the needy (3.7% of the population, 88% of whom earn less than S\$670/month) [15,16]. These public rental flat neighborhoods are scattered across Singapore, forming low-SES enclaves immediately adjacent to neighboring precincts of owner-occupied housing. Our previous study amongst Singaporeans staying in public rental flats (low SES areas) found no difference in pain prevalence between rental flat-dwellers and their better-off neighbors, although chronic pain in the low SES community was associated with functional limitation and unemployment, testament to the disabling effects of chronic pain [17]. However, having run a home-visit program in these low SES rental flat communities providing free health screening since 2011, we noted as an incidental observation that a significant proportion of patients presenting for the health screening also complained of pain issues to the medical staff [18]. In general, pain management services are provided at specialist centers in tertiary hospitals. Residents in low SES communities, having poorer access to primary

care and health services, are also likely to face disparities in access to pain management services [19]. Since it is well known that chronic pain is associated with low-SES, we were interested to further investigate if having chronic pain was truly associated with increased participation in health screening amongst residents in low SES communities in Singapore, and to further explore the relationship between health screening participation and chronic pain via a qualitative study. We hope that these results will aid in addressing the issue of chronic pain in similar resource-poor settings, particularly in urbanized Asian societies.

MATERIALS AND METHODS

1. Study population (quantitative)

The study population consisted of all Singaporean citizens/permanent residents aged 40–60 years, living in five integrated public housing precincts in Singapore, recruited from 2009–2014. In Singapore, due to high urban density, blocks of public rental housing (lower SES areas) and public owner-occupied housing (higher SES areas) occupy the same geographical space, forming integrated public housing precincts. Of the five sites, Site A was located in a middle-aged public housing estate (developed in 1980–1990s), whereas the other sites were located in mature public housing estates (developed before 1980).

2. Study methodology (quantitative)

At baseline, information such as sociodemographic data/medical history was collected in door-to-door visits via interviewer-administered standardized questionnaires in English, Chinese and Malay. Residents were asked for their full self-reported medical history, including history of pain. Interviewers also assessed if residents were adherent to regular screening for cardiovascular disease (hypertension, diabetes, dyslipidemia) and cancer (colorectal, cervical, and breast cancer). Interviewers were medical students who underwent standardized training prior to study commencement. Ethics approval was obtained from the NUS Institutional Review Board, informed consent was sought, and participation was voluntary.

3. Definitions

Chronic pain was defined as pain lasting ≥ 3 months, in line with previous local studies (3). Regular health screening was defined as adhering to the screening fre-

quencies recommended in local guidelines, which were: for those aged ≥ 40 years, blood pressure every 2 years, fasting glucose and lipids every three years; for those aged ≥ 50 years, FOBT every year; for females, aged 25 to 69 years and sexually active, Pap smears every 3 years; for females, mammography yearly for those aged 40–49, and once every 2 years for those aged 50–69.

4. Statistical analysis

Descriptive statistics were computed for the study population. We used Chi-square analysis to examine associations between sociodemographic factors, area-level SES (rental vs. owner-occupied), individual-level SES (education, employment), participation in regular health screening, and chronic pain. Subsequently, we evaluated the relationship between chronic pain and health screening using backward multivariate logistic regression. The criterion for initial entry of variables into multivariate models was $P < 0.2$ on univariate analysis. In our multivariate models for health screening and chronic pain, we controlled for site (mature vs. middle-aged housing estate), employment, and gender, as these were factors associated on univariate and multivariate analysis with chronic pain; where applicable, we also controlled for cardiovascular disease (as this was associated with cardiovascular screening participation on univariate and multivariate analysis). All statistical analysis was performed using SPSS (Version 17.0, USA) and statistical significance was set at $P < 0.05$.

5. Study population and methodology (qualitative)

Respondents were recruited via purposive sampling techniques from a study population staying in rental flat communities in Singapore. Respondents were chosen to ensure roughly similar proportions of gender and ethnic groups compared to the population at large. Inclusion criteria included: having a history of chronic pain (defined as pain ≥ 3 months); being Singaporean citizens/permanent residents; aged 40–60 years, and having lived in the community for at least 3 years. Respondents were recruited via letters of invitation, interviewed at home visits, and were reimbursed \$10 for their contributions. This study was approved by the National University of Singapore Institutional Review Board, and written informed consent was sought from participants. Additional respondents were interviewed until saturation was reached (i.e. when no new themes emerged from the data analysis) [20].

6. Conduct of interview sessions

Individual in-depth interviews (approximately an hour each) for each respondent were carried out in the respondents' homes. Interviewers were medical students who underwent qualitative research training by the senior author prior to study commencement. Interviewers must have had at least 1 year of participation in service-learning programs involving these needy communities. We also matched interviewers to patient respondents by race and language. Interviewers used an interview guide developed by the investigators. Information was collected via open-ended questions in English, Chinese, Malay and Tamil. All residents were asked questions pertaining to general attitudes towards screening tests; and how their pain might affect their attitudes to screening participation.

7. Qualitative content analysis

Iterative content analysis of the verbatim transcripts of the audiotaped interviews was carried out to identify the relationship between chronic pain and health screening, amongst residents in a low-income community living with chronic pain. For the initial transcripts, investigators identified and highlighted every codable "unit of text" in the transcripts that represented a singular idea. Each unit of text in the transcripts was then reviewed and a list of themes was created from each transcript. Investigators then met to discuss the collated lists of themes and produce a master list comprising all the unique themes identified. All accumulated transcripts were then recoded using the master list. Throughout the coding process, the team met regularly and this process was repeated multiple times, allowing investigators to suggest the addition of new themes to the master list as they arose. Finally, recoded transcripts were compared and where there were differences, divergences were resolved through consensus.

RESULTS

1. Association between chronic pain and participation in health screening

Participation rates amongst those aged 40–59 years were 72.0% (936/1300) for the rental flat communities and 61.2% (1101/1800) for the owner-occupied communities, respectively. The prevalence of chronic pain was 14.4% (158/1101) in the owner-occupied population and 14.2% (133/936) in the rental flat population. The detailed profile

of study participants can be found in **Table 1**. We stratified data on screening participation between the non-rental (owner-occupied) and rental flat populations. In the rental flat population, participation in cardiovascular disease screening (diabetes, dyslipidemia) and cancer screening (colorectal, cervical and breast cancer) was associated, both on univariate and multivariate analysis, with prevalence of chronic pain. Those with chronic pain were more likely to be going for regular diabetes screening (α OR =

2.11, 95%CI = 1.36–2.37, $P < 0.001$), dyslipidemia screening (α OR = 2.06, 95%CI = 1.25–3.39, $P = 0.005$), colorectal cancer screening (α OR = 2.28, 95%CI = 1.18–4.40, $P = 0.014$), cervical cancer screening, (α OR = 2.65, 95%CI = 1.34–5.23, $P = 0.005$) and breast cancer screening (α OR = 3.52, 95%CI = 1.94–6.41, $P < 0.001$). This relationship, conversely, was not present in the owner-occupied flat population (**Table 2**).

Table 1. Sociodemographic Characteristics and Prevalence of Chronic Pain Amongst Residents of Five Public Rental Flat Enclaves in Singapore; Compared against Neighboring Enclaves of Owner-occupied Public Housing, from 2009–2014 (N = 2,037)

Characteristic	Age 40–60 years, recruited over 2009–2014 (N=2037)		OR (95% CI)	P value ^a
	Owner-occupied (n=1101)	Rental (n=936)		
	n (%)			
Chronic pain				
No chronic pain	943 (85.6)	803 (85.8)	1.00	0.949
Has chronic pain	158 (14.4)	133 (14.2)	0.99 (0.77–1.27)	
Site				
Middle aged housing estate ^b	505 (45.9)	478 (51.1)	1.00	0.002
Mature housing estate ^b	596 (54.1)	458 (48.9)	1.23 (1.03–1.47)	
Demographics				
Age				
40–50 years	202 (18.4)	210 (22.4)	1.00	0.022
51–60 years	899 (81.6)	726 (77.6)	0.78 (0.63–0.96)	
Gender				
Male	659 (59.9)	523 (55.9)	1.00	0.072
Female	442 (40.1)	413 (44.1)	1.18 (0.99–1.41)	
Marital status				
Not currently married	335 (30.4)	496 (53.0)	1.00	< 0.001
Currently married	766 (69.6)	440 (47.0)	0.39 (0.32–0.47)	
Ethnicity				
Non-Chinese	257 (36.9)	440 (63.1)	1.00	< 0.001
Chinese	844 (63.0)	496 (37.0)	0.34 (0.28–0.42)	
Socioeconomic indicators				
Highest educational attainment				
Primary education or less	417 (37.9)	700 (74.8)		< 0.001
Secondary education	381 (34.6)	214 (22.9)		
Tertiary education	303 (27.5)	22 (2.4)		
Current employment				
Currently unemployed	646 (58.7)	584 (62.4)	1.00	0.093
Currently employed	455 (41.3)	352 (37.6)	0.87 (0.72–1.02)	
Monthly household income				
≤ \$500	146 (26.8)	290 (47.3)		< 0.001
≥ \$500, < \$1000	128 (23.5)	282 (46.0)		
≥ \$1000	271 (49.7)	41 (6.7)		

^aComputed using Chi-square test. ^bSites were divided into mature and middle-aged housing estates. Mature housing estates were developed before 1980 by the Housing and Development Board (Singapore's public housing agency) whereas middle-aged housing estates were developed in the 1980s–1990s.

Table 2. Health Screening Participation and Association with Chronic Pain on Multivariate Analysis Amongst Residents of Five Public Rental Flat Enclaves in Singapore, from 2009–2014 (n = 936); Compared against Neighboring Enclaves of Owner-occupied Public Housing, from 2009–2014 (n = 1,101)

Hypertension screening											
Non-rental population (N = 640)						Rental population (N = 575)					
Hypertension screening	Going for regular screening, N (%)	OR (95% CI)	P value	aOR ^b (95% CI)	P value	Hypertension screening	Going for regular screening, N (%)	OR (95% CI)	P value	aOR ^b (95% CI)	P value
No chronic pain	321/571 (56.2)	1.00		1.00		No chronic pain	217/503 (43.1)	1.00		1.00	
Has chronic pain	45/69 (65.2)	1.46 (0.87–2.46)	0.159	1.25 (0.72–2.15)	0.429	Has chronic pain	38/72 (52.8)	1.47 (0.90–2.42)	0.130	1.26 (0.74–2.15)	0.393
Diabetes screening											
Non-rental population (N = 923)						Rental population (N = 744)					
Diabetes screening	Going for regular screening, N (%)	OR (95% CI)	P value	aOR ^b (95% CI)	P value	Diabetes screening	Going for regular screening, N (%)	OR (95% CI)	P value	aOR ^b (95% CI)	P value
No chronic pain	454/788 (57.6)	1.00		1.00		No chronic pain	267/635 (42.0)	1.00		1.00	
Has chronic pain	90/135 (66.7)	1.47 (1.00–2.16)	0.058	1.10 (0.73–1.66)	0.658	Has chronic pain	65/109 (59.6)	2.04 (1.35–3.08)	<0.001	2.11 (1.36–3.27)	0.001
Hyperlipidemia screening											
Non-rental population (N = 669)						Rental population (N = 640)					
Hyperlipidemia screening	Going for regular screening, N (%)	OR (95% CI)	P value	aOR ^c (95% CI)	P value	Hyperlipidemia screening	Going for regular screening, N (%)	OR (95% CI)	P value	aOR ^c (95% CI)	P value
No chronic pain	291/593 (49.1)	1.00		1.00		No chronic pain	182/555 (32.8)	1.00		1.00	
Has chronic pain	35/76 (46.1)	0.89 (0.55–1.43)	0.628	0.76 (0.45–1.29)	0.310	Has chronic pain	42/85 (49.4)	2.00 (1.26–3.17)	0.003	2.06 (1.25–3.39)	0.005
Colorectal cancer screening											
Non-rental population (N = 899)						Rental population (N = 722)					
Fecal occult blood test screening	Going for regular screening, N (%)	OR (95% CI)	P value	aOR ^d (95% CI)	P value	Fecal occult blood test screening	Going for regular screening, N (%)	OR (95% CI)	P value	aOR ^d (95% CI)	P value
No chronic pain	133/755 (17.6)	1.00		1.00		No chronic pain	46/624 (7.4)	1.00		1.00	
Has chronic pain	23/144 (16.0)	0.89 (0.55–1.44)	0.719	0.89 (0.54–1.44)	0.626	Has chronic pain	14/98 (14.3)	2.09 (1.10–3.97)	0.029	2.28 (1.18–4.40)	0.014
Cervical cancer screening											
Non-rental population (N = 440)						Rental population (N = 334)					
Pap smear	Going for regular screening, N (%)	OR (95% CI)	P value	aOR ^e (95% CI)	P value	Pap smear	Going for regular screening, N (%)	OR (95% CI)	P value	aOR ^e (95% CI)	P value
No chronic pain	110/378 (29.1)	1.00		1.00		No chronic pain	42/277 (15.2)	1.00		1.00	
Has chronic pain	23/62 (37.1)	1.44 (0.82–2.52)	0.233	1.29 (0.71–2.32)	0.405	Has chronic pain	18/57 (31.6)	2.58 (1.35–4.94)	0.007	2.65 (1.34–5.23)	0.005
Breast cancer screening											
Non-rental population (N = 636)						Rental population (N = 517)					
Mammogram	Going for regular screening, N (%)	OR (95% CI)	P value	aOR ^e (95% CI)	P value	Mammogram	Going for regular screening, N (%)	OR (95% CI)	P value	aOR ^e (95% CI)	P value
No chronic pain	67/530 (12.6)	1.00		1.00		No chronic pain	45/433 (10.4)	1.00		1.00	
Has chronic pain	12/106 (11.3)	0.88 (0.46–1.70)	0.872	0.88 (0.45–1.71)	0.154	Has chronic pain	24/84 (28.6)	3.45 (1.96–6.07)	<0.001	3.52 (1.94–6.41)	<0.001

^aControlling for site (mature vs. middle-aged housing estate), diabetes, hyperlipidemia, employment, gender in multivariate logistic regression model. ^bControlling for site (mature vs. middle-aged housing estate), hypertension, hyperlipidemia, employment, gender in multivariate logistic regression model. ^cControlling for site (mature vs. middle-aged housing estate), hypertension, diabetes, employment, gender in multivariate logistic regression model. ^dControlling for site (mature vs. middle-aged housing estate), employment, gender in multivariate logistic regression model. ^eControlling for site (mature vs. middle-aged housing estate), employment in multivariate logistic regression model.

2. Population characteristics (qualitative study)

There were a total of 12 respondents. Respondents' characteristics are reflected in **Table 3**. Of the respondents, an equal number (6 each) came from each gender. The majority were Chinese (10/12, 83.3%) which reflects the ethnic distribution of the Singapore population. These patients were from the lower socioeconomic strata: only a quarter had finished secondary education; two-thirds were currently unemployed, and all had a monthly household income of \leq \$1500/month (compared with the average monthly household income of \$10,503) [21]. All had chronic pain (pain lasting \geq 3 months). Three main themes emerged from our qualitative analysis: pain as an association of "major illness"; screening as a search for answers to pain; and labelling pain as an end in itself (**Table 4**).

3. Pain as an association of "major illness"

Amongst this low-income population living with chronic pain, pain was seen as a harbinger of "major illness". Respondents classified ailments as "major" and "minor", in which major ailments were either defined as ailments producing physical symptoms (pain, breathlessness, weakness, etc.), or ailments producing physical symptoms that were refractory to self-medication/self-reliance, and minor ailments, conversely, were defined as ailments with no physical manifestations, or ailments with physical manifestations that could be managed through self-medication/self-reliance alone. As such, diseases as varied as breast cancer and hyperlipidemia were reframed in terms of the physical symptoms (eg. pain) that were attributed to them:

Interviewer: "Do you know what high cholesterol is about?"

Patient 1: "Yes, high cholesterol gives me knee pain sometimes... So I take traditional Chinese medicine, after that I'm ok."

Interviewer: "Do you know how to check for high cholesterol?"

Patient 1: "No. I thought it's about pain? No?"

In addition, although pain was usually perceived as a consequence of major illness, in a minority of patients, we also observed reverse causality; meaning that pain was perceived as causing major illness:

Table 3. Sociodemographic Characteristics of Study Participants, Comprising Residents with Chronic Pain, Staying in Rental Flat Communities in Singapore (n=12)

Residents (N=20)	
Characteristics	n (%)
Site	
Site A	7 (58.3)
Site B	5 (41.7)
Age (years)	
40–50	6 (50.0)
51–60	6 (50.0)
Gender	
Female	6 (50.0)
Male	6 (50.0)
Married	
Not currently married	5 (41.7)
Married	7 (58.3)
Ethnicity	
Chinese	10 (83.3)
Non-Chinese	2 (16.7)
Educational attainment	
Primary education and below	9 (75.0)
Finished secondary education	3 (25.0)
Employment	
Currently unemployed	7 (58.3)
Currently employed	5 (41.7)
Monthly household income	
\leq \$500/mth	7 (58.3)
$>$ \$500/mth, \leq \$1,500/mth	5 (41.7)
Help needed	
Not on financial aid	10 (83.3)
Receiving financial help ^a	2 (16.7)
Screening participation	
Did not participate in any screening	6 (50.0)
Participated in \geq 1 screening modality	6 (50.0)
Location of chronic pain	
Knee pain	4 (33.3)
Leg/ankle/foot pain	2 (16.7)
Back pain	2 (16.7)
Hip pain	1 (8.3)
Arm or hand pain	1 (8.3)
Generalised pain	2 (16.7)

^aReceiving financial help was defined as: being a recipient of Public Assistance (a national scheme which provides a monthly allowance to indigent citizens who are unable to work due to old age, illness or disability, have no means of subsistence and have little or no family support) or other forms of financial assistance from the local community centre (grassroots organization).

Table 4. Representative Quotes from Patients, Organized by Frequently Mentioned Themes

Pain as an association of "major illness"	
Pain as a consequence of major illness	"Actually, one will know if one is healthy or unhealthy. If you ache all over, have pains everywhere, then something must be wrong, must go and see doctor what. Or else why need to go." (Patient 7) "I think I have a weak heart. When I work, heart cannot pump, blood flow not good, then my arms and legs will ache, very pain, cannot work. When I sleep, my leg aches as well, so I will just massage it by myself. My heart weak, cause me to feel breathless and my limbs ache." (Patient 2)
Pain as a cause of major illness	"If you are sick, then the doctor wants to give you a lot of things, like chemotherapy? But I will rather take traditional Chinese medicine! Because I heard the treatment is very painful and has side effects. The pain is not good for the body...after a while the body will react against it, then you get worse. I know my uncle went for chemotherapy, caused him so much pain, he got thinner and thinner by the day, every day in pain, that's why he passed away faster." (Patient 10)
Tradeoff between "small pain" of screening and "big pain" of illness	"I don't want to take blood test, I'm scared of the needle, scared of the pain. <i>Sakit!</i> ^a Even if you offer me free screening, I also wouldn't go. I've only screened for blood pressure because it's not painful, I haven't screened for anything else. I'll bear with my pain first, only when it gets worse, then cannot bear it anymore, <i>tak boleh tahan</i> ^b , something really wrong, then maybe I'll think about going." (Patient 11)
Screening as a search for answers	
Screening as a search for reassurance	"I'm healthy, the only thing that's been troubling me is this pain in the back that's been going on for the past three years. It's been about the same, but since got free checkup I thought better go, just make sure I'm healthy, everything is ok." (Patient 4)
Screening as a search for answers	"I have this pain down here, the doctor says I'm ok every time, nothing's wrong, it's just stress. But I don't believe him, I'm worried it's cancer. My mum died from cancer. So I want to go and check for cancer too, I'm worried that the pain could be cancer. There has to be a reason for the pain, there can't be pain for no reason." (Patient 3)
Screening as a search for treatment	"I want to go for checkup, find out what is wrong. If they find something, then maybe they can fix it, take my pain away." (Patient 2)
Screening as a search- finding therapy through the search	"I'm not sure if I'll find anything, find a reason (for the pain). But at least it helps to take my mind off things, that I'm actually doing something, trying to find out what's wrong with me. Else sitting here and just waiting for the pain to come on, that makes me feel so useless, like there's nothing I can do to help myself." (Patient 3)
Labelling pain as an end in itself	
Labelling pain as an end in itself- fear of further pain	"Ya, I don't want to think about what happens after. If just medicines, should be ok. But I'm very scared the doctor asks me to go for operation, like that how? I'm scared because I know operations will be painful and I'm not sure whether I can bear the thought of adding even more pain." (Patient 6)
Labelling pain as an end in itself- futility/fatalism	"Even if they screen and they find out where is wrong, what is wrong, I'm so old already, what can be done? Nothing. I don't think they can fix it, take the pain away. When you're old, the body just breaks down, there's nothing you can do." (Patient 7)
Labelling pain as an end in itself- lack of resources (time, money) to pursue further	"They said after the screening that my blood, sugar levels very high. They say sometimes the joint pains you get can be due to that. But I haven't taken any medicines yet. How to take? Honestly, before I got married, every small illness I would go to see the doctor because my company paid for it. But after I got married and became a mother I would not go see the doctor so easily. No time, and also no money. I had to stop work to take care of the children, and also because every now and then the pain becomes very difficult, it just flares." (Patient 5)
Labelling pain as an end in itself- self-reliance as an alternative solution	"No, sometimes when I have leg pain I'll just go buy medicated plasters or ointment. I know the pain is from the leg, the doctor said so, so I just buy plaster and paste, or use <i>feng you</i> ^c and rub. I can treat it by using my own medicine, why need to see a doctor? I don't want to queue up and wait, and it is more expensive. Like that, can already." (Patient 1)
Labelling pain as an end in itself- traditional medicine as an alternative solution	"Sometimes, when the pain is very bad, cannot walk, I go to the <i>sinseh</i> ^d , tell him I need something for the pain. I tell him the doctor already say the pain come from the knee. Then he recommend me a medicine, which works, it's quite good. I rarely see the doctor because it is expensive. I do odd-jobs and my wife cannot work because she is on a long-term visit pass. I'm Singaporean, my wife is from Indonesia. No money to see doctor so often." (Patient 12)

^a*Sakit*: Malay for "pain". ^b*Tak boleh tahan*: Malay, colloquialism for "cannot bear (it) anymore". ^c*Feng you*: traditional Chinese medicated oil, used for rubbing and relief of muscle ache. ^d*Sinseh*: traditional Chinese medicine practitioner.

Interviewer: "Did you do screening before being diagnosed with breast cancer?"

Patient 2: "Yes, I think the test is not good. If I hadn't gone for the test, I might not have gotten the cancer. Because the test is very painful, they use the plates, squeeze on your breast, so painful. Because of that, you will get lumps in the breast and then there might be growths inside the breast after that."

4. Screening as a search for answers

Subsequently, patients embarked on screening as a means to find answers for their chronic pain. While the goal of health screening was to catch disease in the early asymptomatic stages, patients had already reframed "major diseases", as those that caused them physical manifestations, such as pain. Thus, participation in screening was seen as not a means to pick up asymptomatic disease, but rather as a way to find an explanation for the pain that was troubling them:

Patient 3: "40 years ago I did a colonoscopy because I had recurrent stomach pain."

Interviewer: "So you did the exam (colonoscopy) because you had frequent stomach pains?"

Patient 3: "Yes, last time I had frequent stomach pain, I tried to bear with it but couldn't manage. It got worse. So finally I had to see a doctor. They recommended me to go (for colonoscopy). Now, I don't have stomach pain anymore, no issues, so I don't think I need to go again."

5. Labelling pain as an end in itself

Some patients viewed the screening process as just a means to find out potential causes of their chronic pain; they did not wish to proceed on to further investigation, management or treatment. For some, this ambivalence was related to the fear of further pain:

Patient 4: "Yes, but if you do screening, if they find you have cancer, need to go for operation— if need operation, surely there will be pain. I went for an operation previously, so painful. Took me so long to recover after that...I'm scared of operations, scared of the pain."

Most acknowledged the inadequacy of such an approach; but were forced by circumstances to accept these

inadequacies. In some cases, having diagnosed an ailment with the resources of the healthcare system, they then tried to find solutions to their problem outside of the healthcare system:

Patient 5: "Of course finding a reason for my pain is not enough...But no choice, no money to take all these expensive medicines. So when the doctor told me there was a problem...I take care...go to the sinseh for tui na†...It's cheaper that way."*

*Sinseh: traditional Chinese medicine practitioner

†Tui na: form of traditional Chinese manipulative therapy/massage

DISCUSSION

Amongst those staying in the lower-SES areas, having chronic pain was consistently associated with greater participation in regular cardiovascular disease screening as well as cancer screening; however, this did not occur amongst those staying in the higher-SES areas. Initially, we had considered that the functional limitation and disability associated with chronic pain would constitute an additional barrier to screening participation; hence greater participation in regular screening was surprising [17,22]. Previous studies suggest that those of lower education try to place the responsibility of managing pain on others, rather than depending on self-reliance [23,24]. In Western studies, chronic pain sufferers staying in a less affluent area have lower levels of involvement in their own health-care and those of lower-SES suffering from chronic pain tended to rely on avoidant coping [24,25]. This seems the opposite of our population. Perhaps in Asian populations, with lower knowledge of self-care strategies, chronic pain pushes them to seek out healthcare providers for management of their pain problem with a corresponding increase in usage of services like health screening [26,27]. This may be further accentuated in disadvantaged neighborhoods, with fewer options for support other than through the health system.

In our qualitative analysis of the relationship between health screening and chronic pain in this low-SES population, three main themes emerged: pain as an association of "major illness"; screening as a search for answers to pain; and labelling pain as an end in itself. Individuals

in this low-SES population could not relate to the concept of asymptomatic disease; to them, disease only occurs when symptoms manifest, such as chronic pain. Thus, they went for health screening with the expectation of finding an explanation for their pre-existing symptoms of pain, rather than the understanding that these tests were meant to pick up disease at an early asymptomatic stage. The process of screening provided relief in itself. This was similar to other studies with disadvantaged populations, in which seeking healthcare enabled these individuals to gain a sense of agency; and also allowed them to obtain a hearing from a healthcare professional [5,28]. Worryingly, though, for a large number of individuals the labelling of pain was seen as an end in itself, due to the lack of resources, fear, or misperceptions. This was dissimilar to the experiences reported by Dima et al. [29], in which patients wished to go beyond diagnostic labels and understand thoroughly the cause of their chronic pain, probably because they had more available resources. Individuals in our study population could not follow up with treatment due to limited resources, and either lapsed into ambivalence, frustration, or sought to find their own methods of treating their conditions. Amongst Singaporean patients with chronic pain, 84% were using traditional medicine [30]. Thus, although chronic pain may serve as an impetus for these low-SES individuals to re-engage with the healthcare system, support structures must be in place to facilitate re-integration. This is important, given the strong association between chronic pain and SES [31].

This study has several limitations. This was a cross-sectional study, not a prospective one; thus we can only identify correlation, not causation. In addition, this study was carried out in five geographical sites; we were unable to obtain a nationally representative sample of the rental flat population in Singapore because of logistical difficulties, as rental flats are scattered across the entire country in socially-integrated precincts. However, we note that our study population is fairly similar in terms of socio-demographic makeup, when compared against national data on low-income neighborhoods [16].

In conclusion, in this low SES area population within an urbanized multi-ethnic Asian society, chronic pain was associated with higher screening participation across a number of disease modalities. Health professionals caring for such populations should be alert to the possibility that chronic pain may present as the “hidden agenda” of par-

ticipating in health screening. More research is needed to investigate perceptions of chronic pain and coping strategies in low-income Asian populations, and how this shapes their attitude towards health and health-seeking behaviors.

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