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A Longitudinal Study of Resident Emotional Stability, Self-Reported Health and Perceptions of Programmatic Support

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Abstract:

Purpose: *Certain characteristics such as acceptance, planning, and humility have correlated with less burnout among resident physicians. However, less is known about residency program culture, socialization, and support. The purpose of this study is to investigate social isolation, solidarity, stress, and frustration over time, their self-reported health, as well as the programmatic support.*

Methods: *A longitudinal self-administered survey implemented within an academic pediatric residency program to track resident characteristics over time.*

Results: *In Wave 1, among 101 residents, 78 (77%) responded. In Wave 2, among 98 residents, 73 (74%) responded. 45 residents were in both Wave 1 and 2. All measures of resident characteristics were stable over time. Worse overall health at Wave 2 is associated with feeling alone in residency at Wave 1 (r -.48). More stress (r .35), frustration (r .36) and feeling alone (r .53) (Wave 1) is associated with higher reports of bad mental health in Wave 2 while inversely associated with socializing frequently with other residents outside of work (r -.36) (Wave 1). Thinking the program helps residents cope with stress (r -.49) and that they communicate resources (r -.35) (Wave 1) correlate with improved mental health (Wave 2).*

Conclusion: *Both negative characteristics such as stress and frustration as well as positive ones such as trust and socialization are stable over time. Some Wave 1 characteristics are healthful for residents while others deleterious at Wave 2. Perceptions of programmatic involvement may be helpful for resident mental health.*

INTRODUCTION:

Burnout, stress, and an unhealthy work environment among residents increase medical errors and affect patient safety [1]. Burnout also worsens throughout residency training, and many who feel burnt-out do not recover [1,2]. Changes in duty hour requirements have had an equivocal impact on resident burnout and residency stress and burnout are potentially associated with resident depression [3,4].

These studies suggest that there are important factors beyond duty hours and structured work environment that affect burnout and stress. Residents who employ coping strategies such as acceptance, planning, optimism, and humility have decreased burnout, but those who employ venting, denial, and disengagement have increased burnout[5] and few struggling or depressed trainees seek help[6]. If both programmatic factors and personal factors impact burnout, and struggling trainees think others will trust them less [6], then personal connections with other residents within the program may be important in moderating stress during residency.

In order to look at relationships between resident social isolation, self-perceived sources of stress and frustration, perceptions of programmatic support during residency, and self-reported overall health and number of bad mental health days, we focus on associations between these variables longitudinally at one institution.

METHODS:

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Study Design

This was a longitudinal cohort study among resident physicians in large academic pediatric residency program in the Southern US. We use cohort data from two waves, fielded one year apart (2013 and 2014).

Materials and subjects:

All pediatric residents were invited to participate in an anonymous, confidential survey. Some changes were made by the residency program between Waves 1 and 2 that should not be understood as interventions as they were independent of this study, but are nonetheless important to note. These changes were specific attempts to help struggling residents, as identified by the team a chief residents. They skipped morning conferences bimonthly so chief residents could take residents to coffee and talk about struggles and also opened chiefs' schedules so they could "walk and talk" with residents on a popular local pedestrian walkway. During intern orientation a psychiatrist for residents did a Q&A session, which was repeated half-way through the year at an intern retreat. Finally, recurring "comfort food dinners" were hosted by 2nd or 3rd year residents for the interns where they had the chance to bond and talk through difficulties and how they overcame them.

Technical information:

We created and collected a series of single-item measures for resident social embeddedness/isolation. To measure relationships inside and outside of work we asked two questions: "how many times per month do you go socialize with other residents outside of work" and "how many times per month do you go socialize with other non-residents outside of work?" We also asked them to count and report how many other residents are their "friend," whether they "feel like you are in residency 'alone'," "feel like you are a part of [Residency Program]," and whether "your year (intern, etc.) tends to have strong cliques" or whether "the program tends to have strong cliques."

Four additional indexes for stress, frustration, trust and solidarity were either uniquely constructed or adapted from prior studies.

Stress: The question stem stated, "how much stress does each of the following cause you" - "patient overload", "program leadership", "your schedule", "time off", "patient acuity", "lack of professional guidance" and "lack of clinical guidance." Response options ranged between "none" and "a lot" on a ten-point scale (α, W1=.82; W2=.87).

Frustration: We asked "how frustrated are you with" – "the program as a whole", "program leadership", "your co-residents", the hospital as a whole", "current health care delivery", "too few patients", "too many patients" and "not enough reading time." Response options ranged from "not at all" to "very much" on a ten-point scale (α, W1=.84; W2=.80).

Trust: Our trust measure is an adaptation of standard trust measures and more recent refinements[7, 8]. We asked the following six questions, all with responses on a five-point scale ranging from "not at all" to "very much": "other members of this residency can be trusted", "you can't be too careful when interacting with others in this program", "other members of this residency try to be helpful", "other member of this residency are mostly looking out for their self", "other members of this residency would try to take advantage of you if they had the chance", and "other members of this residency try to be fair" (α, W1=.86, W2=.82).

Solidarity: We include two indexes to measure solidarity with three questions each: affective regard and social unity [9]. All are measured as opposite points on a seven-point scale, asking whether group members are: awful/nice, bad/good, uncooperative/cooperative (α, W1=.93, W2=.94), adversaries/partners, self-oriented/team-oriented, coming apart/coming together (α, W1=.87, W2=.95).

In order to asses perceptions of program supports at Wave 2, we asked "do you feel as though the residency program…" – "cares about your mental and emotional health", "effectively communicates the availability of mental health resources", and "effectively helps you cope with job-related stressors, such as the death of a patient, occurrence of a bad outcome or a mistake is made." This was measures on a 5-point scale from "never" to "all of the time."

Finally, in Wave 2 mental health was self-reported via a question asking, "thinking now about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?" [10] Overall health was also self-reported, asking "in general, would you say your own health is… poor, fair, good, very good, excellent."

Statistics:

We set our alpha error at the conventional .05 p-value. Included are bivariate correlations with Fisher's correction and the associated confidence intervals in order to bolster the reliability of the estimates. After checking stability over time we focus on resident-characteristics/perceptions with the mental and physical health measures.

Ethical approval:

The survey was approved by the Baylor University institutional review board.

RESULTS

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Table 1: Stability over Time for Resident Characteristics

	Range	W1 Mean (Stdv)	W2 Mean (Stdv)	Fisher Corr	Low CI	High CI
Stress	1 - 5	2.43 (0.7)	2.24 (0.72)	0.618*	0.380	0.773
Frustration	1 - 5	2.19 (0.66)	2.08 (0.57)	0.776*	0.616	0.871
Trust	1 - 5	4.29 (0.54)	4.29 (0.51)	0.743*	0.537	0.860
Affective Regard	1 - 7	6.35 (0.65)	5.47 (0.61)	0.651*	0.407	0.802
Social Unity	1 - 7	6.25 (0.78)	5.35 (0.79)	0.619*	0.361	0.782
Res. Socialization	1 - 16	4.16 (3.3)	3.87 (2.63)	0.797*	0.650	0.883
Non-Res. Socialization	1 - 23	5.3 (3.64)	5.48 (4.34)	0.644*	0.419	0.788
Res. Friends	1 - 50	11.16 (5.77)	13.22 (11.38)	0.711*	0.519	0.830
In Res. "Alone"	1 - 5	1.85 (1.05)	1.82 (1.09)	0.636*	0.398	0.788
Feel Part of Program	1 - 5	3.75 (1.08)	3.38 (1.11)	0.665*	0.438	0.806
Year Cliques	1 - 5	3.25 (1.13)	3.22 (1.04)	0.679*	0.459	0.815
Prog. Cliques	1 - 5	2.98 (1.07)	3.07 (1.05)	0.639*	0.401	0.789

*Note: Fischer correlation estimates for characteristis at W1 with same at W2; n = 45; * = p<.001*

Table 2: Wave 2 Health Measures and Wave 1 Correlations

	Fisher Corr	P	Low CI	High CI
Overall Health				
Stress	-0.185		-0.473	0.139
Frustration	-0.290		-0.555	0.028
Trust	0.221		-0.116	0.513
Affective Regard	0.109		-0.328	0.329
Social Unity	0.135		-0.339	0.318
Res. Socialization	0.304		-0.008	0.563
Non-Res. Socialization	0.103		-0.215	0.402
Res. Friends	0.125		-0.194	0.420
In Res. "Alone"	-0.489	**	-0.704	-0.191
Feel Part of Program	0.187		-0.151	0.486
Year Cliques	-0.271		-0.550	0.063
Prog. Cliques	-0.137		-0.445	0.201
Bad Mental Health Days				
Stress	0.348	*	0.036	0.598
Frustration	0.355	*	0.044	0.603
Trust	-0.003		-0.331	0.326
Affective Regard	0.000		-0.229	0.421
Social Unity	-0.011		-0.205	0.442
Res. Socialization	-0.360	*	-0.604	-0.054
Non-Res. Socialization	-0.171		-0.462	0.153
Res. Friends	-0.142		-0.434	0.178
In Res. "Alone"	0.525	***	0.255	0.719
Feel Part of Program	-0.082		-0.383	0.236
Year Cliques	0.209		-0.109	0.489
Prog. Cliques	0.164		-0.156	0.452

*Note: n = 45; + = p<.1, * = p<.05, ** = p<.01, *** = p<.001; Fisher Correlation estimates*

Table 3: Bad Mental Health Days and Perceptions of Program's Interest

	Fisher Corr	P	Low CI	High CI
Program cares about MH	-0.251		-0.522	0.065
Program Communicates Resources	-0.349	*	-0.596	-0.042
Program helps cope with stress	-0.489	**	-0.697	-0.205

*Note: n = 45; * = p<.05, ** = p<.01; Fisher Correlation estimates*

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In Wave 1, among 101 residents, 78 (77%) responded. In Wave 2, among 98 residents, 73 (74%) responded. 45 residents were in both Wave 1 and 2 (see Figure 1). Table 1 shows the Fisher correlation coefficient for resident characteristics as measured at W1 and W2. All characteristics are stable over time (positively correlated with the same measure at W2, p<.001). Some characteristics were notably highly stable: frustration (0.77), trust (0.74), socializing with other residents (0.79) and number of resident as "friends" (0.71) (see Table 1). Feeling "alone" is notable because the correlation is slightly lower than others despite the fact that the means and standard deviations are nearly the same, indicating that those who felt alone differed between W1-W2.

Table 2 shows these same resident characteristics from W1 with two self-reported health measures at W2: overall health (range: 1-5, median: 4) and number of days with poor mental health (range: 0-26, median: 4). Only feeling "alone" in residency (-0.49, p<.01) is tied to worse overall health. Frustration (0.36, p<.05) and feeling "alone" in residency (0.53, p<.01) again have deleterious effects, with the addition of stress (0.35, p<.05), on mental health. Socializing with other residents, however, was associated with fewer bad mental health days (-0.36, p<.05) (see Table 2).

Table 3 shows the correlation between the number of reported bad mental health days with perceptions about the residency program (both at Wave 2). Residents reported fewer mental health problems when they felt the program clearly communicated mental health resources (-0.35, p<.05) and that the program helps them cope with stress (-0.49, p<.01) (see Table 3).

DISCUSSION:

This study was an attempt to begin to understand how social dynamics relate to resident health. Overall frustration and stress at Wave 1 was associated with increased experience with worse mental health at Wave 2 while feeling alone in residency was associated with lower self-reported overall health as well as worse mental health. On the other hand, socializing more frequently with other residents at Wave 1 had an ameliorative effect on reported mental health at Wave 2 while socializing with non-residents did not. On the programmatic side, residents who thought the program communicated mental health resources and that they help cope with stress (both at Wave 2) also reported better mental health.

These findings echo other work showing that a key stressor in medical training is interference with one's social support, and that risk of depression is greater for those with lower support from friends, fellow medical students and one's medical school [12]. Tempski et al. also note that medical trainees' reported quality of life was related to time for and presence of meaningful relationships with others [13]. It is notable that other measures, such as feelings of trust, solidarity, feeling like a part of the program and frequent socialization with non-resident friends were not associated with either health measure. A larger sample may tease out some effect with solidarity as both measure show solidarity degrading over time much more than other measures (each drop by almost a full point). As such, while socialization frequency matters and is stable over time, some residents may be left out and lose their sense of connectedness over time. There may be a compounding effect as some report increased presence of negative emotions or depression throughout training, which could lead to the erosion of social connectedness [11]. Indeed, Tempski et al. show lower quality of life as a result of insufficient time for relationships in medical school[12], a habit that could be in place by residency.

As mentioned, residents' perception of this program's attempts to communicate mental health resources and view that the program helps them cope with stress was linked with fewer reported bad mental health days. Considering the stigma associated with mental health within the medical profession this could merely mean that residents with better mental health were more receptive to the program's attempts at interventions. Some interventions, however, are linked to lasting decreased anxiety [12]. But help seeking avoidance starts quite early and programmatic intervention may need to happen early on in training [13].

There are several limitations to consider. First, this data is from a single residency program and generalizing findings to other programs is cautioned; there may be particular local factors uniquely affecting resident wellness positively or negatively. However, the longitudinal nature of these findings gives an important perspective that is an important contribution to the literature. Second, although these data are longitudinal, they are also correlations and do not control for potential spurious relationships: inferred causation is cautioned. Those residents who perceived lack of program support report worse health. Other residents perceived their program as being appropriately supportive. Is this difference in perception merely a marker of resident wellness? Is it just that frustrated, stressed out, and disconnected residents did not perceive the support offered them? Or, did those healthy residents access the support offered them? The programmatic stress and frustration measures were not tested and thus respondents may not have interpreted the questions as intended.

This study has important implications for residency program leadership. First, these findings suggest that residency program interventions may, in fact, ameliorate mental health

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leading to decreased burnout. Future intervention trials would help here. Second, as duty hours have an equivocal effect on burnout, this study reveals other forces that are important for resident wellness: residency program culture, supportive leadership, and inter-resident support. Fostering these attributes in this residency program was positively associated with wellness. Encouraging such interventions in other programs are worth considering. Third, resident attributes – both positive and negative – remained stable over time. This is discouraging: what can residency program leadership do to foster positive coping among those who are struggling? The variance of perception of program support was the significant variable. How do program leaders communicate support services to their residents – especially those who are most vulnerable?

Further studies should track person and program characteristics on into physicians' careers as we show they are not only stable but also provide initial evidence for ties to worse mental and overall health in some cases. As more frequent socialization with co-residents, feeling "alone" and some program-specific characteristics relate to resident mental health, healthy programmatic culture could be important and further clarity is necessary, especially whether such interventions during residency protect against future career burnout.

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