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The Prevalence of Social and Behavioral Topics and Related Educational Opportunities During Attending Rounds

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Supplemental digital content for this article is available at [LWW INSERT LINK].

Abstract

Purpose—To quantify the prevalence of social and behavioral sciences (SBS) topics during patient care and to rate team response to these topics once introduced.

Method—This cross-sectional study used 5 independent raters to observe 80 inpatient ward teams on internal medicine and pediatric services during attending rounds at two academic hospitals over a five-month period. Patient-level primary outcomes – prevalence of SBS topic discussions and rate of positive responses to discussions – were captured using an observational tool and summarized at the team level using hierarchical models. Teams were scored on patient- and learner-centered behaviors.

Results—Observations were made of 80 attendings, 83 residents, 75 interns, 78 medical students, and 113 allied health providers. Teams saw a median of 8.0 patients per round (collectively, 622 patients) and 97.1% had at least one SBS topic arise (mean = 5.3 topics per patient). Common topics were pain (62%), nutrition (53%), social support (52%), and resources (39%). After adjusting for team characteristics, the number of discussion topics raised varied significantly among the 4 services and was associated with greater patient-centeredness. When topics were raised, 38% of teams' responses were positive. Services varied with respect to learner- and patient-centeredness, with most services above average for learner-centered, and below average for patient-centered behaviors.

Conclusions—Of 30 SBS topics tracked, some were addressed commonly and others rarely. Multivariable analyses suggest that medium-sized teams can address SBS concerns by increasing time per patient and consistently adopting patient-centered behaviors.

Social and behavioral sciences (SBS) have received increased attention in medical education and patient care as our health care system struggles to understand chronic disease management, evolving models of health care delivery, and widening health disparities.[1,2] In the clinical setting, SBS research addresses how behavioral and social processes such as cognition, motivation, socioeconomic status, and social support predict or influence health outcomes or health risk factors. Integrating an SBS focus into medical practice includes core content in multiple areas: health-related behaviors (e.g., patient's diet and clinician's adherence to procedure guidelines), behavior change counseling (e.g., goal setting and shared problem solving), sociocultural factors (e.g., language and literacy), mind-body factors (e.g., stress and pain management), professionalism/ethics, and health policy and economics.[1,2] Recent studies estimate that social and behavioral factors account for nearly 50% of premature morbidity and mortality,[3,4] and ongoing changes to medical school admissions tests and core competencies designate SBS as essential to medical education and clinical care.[2,5]

Beyond particular content areas, SBS also plays a role in understanding the process of delivering patient-centered care and learner-centered education. Patient-centered care requires providers to elicit a patient's sociocultural context and preferences and then engage in shared decision making.[6,7] Social and behavioral factors inform basic processes such as empathy, communication, emotion regulation, and cognition. Similarly, learner-centered education requires educators to tailor instructional techniques for activated learners'

needs.[8,9] Both patient- and learner-centered approaches yield superior outcomes when compared to provider-centered approaches.[9–11]

SBS medical education guidelines have been established through current milestone and competency frameworks;[1,2,12,13] however, little is known about pedagogies, content, and timing for SBS integration.[14,15] While SBS training often focuses on ambulatory settings, an SBS focus remains equally important during inpatient care. Responsiveness to social variables may improve hospital performance in high-visibility quality metrics such as patient satisfaction, pain management, hospital length of stay, and readmission rates.[16–18] On the contrary, inattention to SBS factors contributes to poor post-hospitalization outcomes and frequent re-admissions.[19] For instance, nearly 20% of all Medicare patients are re-admitted within 30 days caused by failures in medical adherence, lost transitions of care, failure to understand a patient's resources, and poor comprehension of discharge instructions.[19]

Attending rounds provide a powerful platform for teaching clinical competencies, modeling humanistic care,[20,21] and highlighting the integral role of social and behavioral factors in optimizing patient outcomes. However, tension between patients' and learners' needs may surface during attending rounds. In the context of limited time, resources, and acute medical management, teams should ideally provide patient-centered care while concurrently providing learner-centered clinical teaching.[22] Figure 1 illustrates the interplay of these competing demands in shaping how SBS topics emerge during inpatient care and teaching. More specifically, competing demands during attending rounds may determine both the presence (quantity) and team response for SBS topics. While teachers must address both learner and patient needs, contextual or environmental factors (e.g. team size, patient census) may alter this balance. Learner- and patient-centered skills (i.e. the "process" boxes in Figure 1) directly influence what content is elicited from learners (e.g. rotation goals, learner needs) and patients (e.g. presenting symptoms, patient needs). Patient "content" directly influences what SBS topics emerge (quantity) and how they are handled by the team (team response). Teaching "content" such as rotation goals and learner needs similarly influence SBS topic quantity and team response – e.g. a teacher may be more likely to screen a patient for alcohol use and spend time teaching about brief interventions for alcohol if the learner has indicated this as an interest or need. Ultimately, this complex interplay of process, content, and contextual factors may explain how SBS topics emerge and are discussed during attending rounds.

In this study, we observed inpatient attending rounds for internal medicine (IM) and pediatrics (Peds). Our aim was to quantify SBS topic prevalence during patient care and to rate team response to any topic once introduced. We hypothesized that during attending rounds, services would vary in SBS topic prevalence and SBS topic responses, and that this variation might be related to differences in team performance in patient- and learner-centeredness, after controlling for demographic and contextual factors.

Method

From February 2012 – June 2012, we conducted a cross-sectional observation study of inpatient attending rounds at two academic hospitals, Stanford School of Medicine and the

University of California, San Francisco, School of Medicine (UCSF). Paired observers accompanied rounding teams as they visited patients, recording the prevalence and team responses of SBS topics, and team leaders' patient- and learner-centered behaviors. Medical teams eligible for this study included at least one resident or attending physician (trainer) and at least one medical student or intern (learner).[21] We recruited teams by likelihood of learners (interns, medical students) present and rater availability. Attendings on eligible teams were contacted via email to participate in the study. Participants were provided an institutional review board-approved information sheet describing the study as observations of "clinical teaching on ward rounds" but were not specifically told about the focus on SBS topics. Teams were assured that raters would not interfere with rounding activities and were asked to proceed normally. The institutional review boards at UCSF and Stanford Schools of Medicine certified the study as "exempt." Participation was voluntary and written informed consent was not required.

Codesheet development and rater training

As a multi-disciplinary research team, we developed the codesheet and iteratively tested it for construct and face validity (see Supplemental Digital Appendix 1) [LWW INSERT LINK]. SBS topics, as well as potential team responses, and patient- and learner-centered behavioral items as well as anchors were described in a detailed codebook.

We locally recruited three pre-medical students and two graduate students and trained them as raters, to be deployed in pairs. We used training videos of clinical re-enactments during rater trainings to assure inter-rater reliability and agreement. Supervisors (JS, SB, and JR) periodically joined the raters during attending rounds and held weekly fidelity and calibration meetings.

Outcome variables and data collection

Patient-level outcomes—We identified thirty SBS topics a priori using pivotal SBS reports[1,2] and a validated instrument identifying culturally competent clinical care.[23] After an SBS topic was raised, we scored team responses as negative, neutral, or positive, where a negative response undermined or devalued the communication, a neutral response failed to further conversation, and a positive response explored or reinforced topic discussion. For each patient, raters documented SBS topics raised during rounds, by whom the topics were raised (team member or patient or family member), and the team's response to each SBS topic discussion.

Team-level data—We identified five attributes of team leaders' patient-centeredness from a validated communication scale[24] and recent reports on patient-centered care.[6,25] Patient-centered care included: shows care (treats patient with dignity and engages patient), elicits information (explores patient's circumstances to provide better care), educates patient (checks for understanding regularly), and appropriately sets up and facilitates a shared decision making conversation (first elicits preferences on who should be involved in decision-making then guides a shared exploration of patient's values and options for treatment). Similarly, we adapted existing learner-centered principles[8] to assess five attributes of team leaders: fosters a stimulating learning climate (environment encourages

questions and prioritizes learning), discusses learner goals (explicitly states goals and incorporates learner goals into teaching), presents material to enhance understanding (material clear and organized emphasizing key points), provides constructive feedback (respectful exchange with concrete steps for improvement, includes positive and negative feedback), and promotes teamwork. After attending rounds, each rater independently scored the team leader's 10 patient- and learner-centered attributes on 5-point Likert scales, and then came to a consensus score for each item.

For each team, raters recorded team demographics (number of members by type; leader type) and caseload characteristics (number of patients, duration of rounds).

Data analysis

We describe team demographic and caseload characteristics by service via median (inter-quartile range) frequencies and percentages. We summarize team leaders' learner- and patient-centered care via composite means (SD) across the respective five attributes.

Topic-specific SBS outcomes—For each SBS topic, patient-level topic prevalence is the proportion of patients for whom discussion of a topic was raised according to either rater; and topic positive-response rate is the proportion of discussions noted as "positive" by either rater, among patients for whom a topic was raised. We estimated mean (95% CI) frequencies of these dichotomous outcomes and tested for variation among services using generalized estimating equation (GEE) models with team as a random effect.

Across-topic SBS outcomes—SBS topic count is the sum of all topics discussed per patient (range, 0 to 30). SBS positive-response rate was calculated as the percentage of topics discussed (per patient) that received positive scores, 100% × response count/topic count (where response count is the sum of topic discussions receiving positive scores). Thus, topic prevalence and topic positive-response rate distinguish among topics while SBS topic count and SBS positive-response rate average over topics within a patient. We analyzed SBS topic count and SBS positive-response rate using GEE models as above assuming Poisson and binomially distributed outcomes, respectively. In bivariate models we evaluated dependence of each (patient-level) outcome on (team-level) demographic, caseload, and patient- and learner-centered characteristics; for continuous variables we included quadratic terms when statistically significant ($\alpha = 0.05$). We constructed multivariable models by including all covariates except service and reducing the model to the statistically significant subset; then including service and its interactions with remaining covariates, and reducing this model similarly.[26] Outcome estimates were generated from the final model at covariate levels typical of the overall sample, which we plotted to illustrate main relationships. We report Dunnett-Hsu adjusted *P* values testing for differences between services. We conducted all statistical analyses using SAS software, version 9.2 (SAS Institute, Cary, North Carolina).

Results

Team characteristics

We observed 20 rounding teams at four practice settings (services): Internal Medicine (IM) and Pediatrics (Peds) at two teaching hospitals, one each at Stanford and UCSF (Table 1). IM teams typically included 5 members (e.g., 1 attending, 1 resident, 2 interns or medical students, and 1 non-MD) and Peds teams included 7–8 members (e.g., 1 attending, 1 resident, 4 interns or medical students, and 1–2 non-MDs). At Hospital 2, 82.5% of rounds were led exclusively by an attending, compared with 12.5% at Hospital 1 where shared leadership was more common. At both hospitals, rounds covered 2–13 (median, 8) patient cases during 0.8–3.5 hours (median, 2.0). Teams with the highest mean caseload spent 12 minutes per patient, compared to 20 minutes for those with the lowest caseload.

Overall, learner-centered item scores ranged from 2.7 to 3.6, yielding a composite mean (SD) of 3.15 (0.65) (Table 1). Patient-centered item scores ranged from 2.0 to 3.5, yielding a composite of 2.81 (0.59). Shared decision making components in the patient-centered domain scored lowest in all services, while learner-centered scores varied among services.

Prevalence of SBS topics

Of 622 patients seen by 80 teams, 97% had at least one SBS topic arise. Topic prevalence varied across the 30 topics (Table 2), ranging from 1.1% to 62%, with a median of 13%. The most common topics (with prevalence above the third quartile; 25%) were nutrition/diet, referral (adherence), social supports, resources, pain, and patient education. The least common topics (with prevalence below the first quartile; 5.6%) were prevention/screening, smoking, unsafe sexual behavior, gender/sexual orientation, spirituality, and integrative medicine.

The prevalence of most topics differed significantly among services. Alcohol, drugs, smoking, and socioeconomic status were discussed primarily by IM services. Exercise, prevention/screening, social supports, language, pain, and patient education were most commonly discussed by Peds-2. Behavior-change counseling topics were discussed primarily at Hospital 2.

The overall mean SBS topic count was 5.3 per patient (95% CI, 5.0–5.7), of 30 possible topics (3rd quartile = 7; maximum = 18). By service, the mean SBS topic count ranged from 3.7 (3.2–4.3) for Peds-1 to nearly double 7.3 (6.9–7.8) for Peds-2 ($P < .001$; df = 3). Bivariable models indicate that SBS topic count was higher if team size was moderate rather than small or large. SBS topic count increased with lower patient census and more time per patient, and with short or long rounds rather than medium-length rounds. SBS topic count also increased with both patient- and learner-centeredness (Table 3).

Multivariable modeling of SBS topic count identified four significantly associated covariates. Evaluated at an “average” team’s characteristics (i.e., 6 members, composite patient-centeredness = 2.8, and 8 patient encounters in two hours), the adjusted mean was 5.6 (95% CI, 5.3–6.0) topics per patient. The association of SBS topic count with team size varied by service (interaction $P = .05$, df = 3), rising with team size (1.05 to 1.1-fold higher

per additional member) in three services but falling in the fourth service (Figure 2). For all services, mean SBS topic count also increased with greater patient-centeredness (1.18-fold higher per point; $P < .001$) and longer duration of rounds (1.08-fold higher per half-hour; $P < .001$) and decreased with higher patient census (0.96-fold as high per additional patient; $P = .003$). Changing the values of the covariates defining the "average" team would shift the rates upward or downward but would not change the slopes (Figure 2). After adjustment, differences between services, versus IM-1, were not statistically significant (Dunnett-Hsu $P > .28$). In particular, for Peds-1, which had the highest patient census and shortest duration of rounds and lowest patient-centered score (Table 1), adjustment raised the mean SBS topic count to 5.1 (4.4–5.8) for an "average" team; while Peds-2, with the lowest patient census, adjustment lowered the mean SBS topic count to 6.1 (5.6–6.7). Adjusted means for IM-1 and IM-2 were 5.2 (4.8–5.8) and 6.2 (5.5–7.1), respectively.

Responses to SBS topics

Topic positive-response rates ranged from 13% to 64%, with a median of 38% (Table 4) indicating the percentage of positive team responses by topic. Topic positive-response rates above the third quartile (47%) occurred for prevention/screening, literacy, spirituality, psychiatric illness, patient education, goal setting, and shared problem solving; rates below the first quartile (29%) occurred for referral (adherence), tests/procedures (adherence), alcohol, smoking, unsafe sexual behavior, social supports, and socioeconomic status. Some topic positive-response rates varied significantly among services: pain (higher at Hospital-1), social supports (higher in IM services). Likewise, there was variance in two aspects of medical adherence (both lowest in Peds-1): referrals and tests/procedures.

The mean SBS positive-response rate was 38% per patient (95% CI, 34%–42%; 3rd quartile = 50; maximum = 100) indicating the percentage of positive team responses per patient across all SBS topics. In bivariable models, the SBS positive-response rate was not significantly associated with covariates studied, including service ($P = .54$; df = 3); however, it tended to increase with lower patient census, more time per patient, and patient-centeredness (Table 3). In multivariable models, no adjusted association was statistically significant (not shown).

Discussion

Our main findings show that SBS topics arise frequently with nearly every patient encounter and, for all services, the number of SBS topics raised is strongly associated with teams' patient-centeredness. Further, team size influences how many topics are addressed: more team members were a distraction when minutes per patient were few but an asset when more time was available. Traditionally stigmatized topics, such as alcohol and psychiatric illness, were raised less commonly than anticipated according to population prevalences.[27,28] Although SBS topics were commonly discussed, team responses to these topics were positive in only 38% of opportunities, on average, suggesting that many SBS "teachable moments" are not being fully utilized. This tended to improve with lower caseloads and higher patient-centeredness ratings. Lastly, our findings show there were opportunities for improvement in overall patient- and learner-centered behaviors during attending rounds.

Although team size, patient census, and pressures for rapid discharge are often described as barriers to quality inpatient clinical care and teaching,[6,22,29] we found limited supporting evidence. Our analysis suggests that certain features of attending rounds can be positively associated with SBS topic prevalence. For instance, having sufficient time per patient, a service-appropriate team size, and giving careful attention to more patient-centered interactions were all associated with better attention to SBS topics. This is consistent with Balmer and colleagues' study, which found that contextual factors challenge, but do not prevent, bedside teaching.[29]

Although case-mix affects SBS topic relevance and varies between services (e.g., some topics are relevant for adults but not children), SBS topic discussion frequencies may also reflect clinicians' acuity and self-efficacy in identifying and responding to patients' circumstances. Clinicians may not understand how to make use of the seldom-raised topics in furthering patient care, whereas the often-raised topics may be easier to address. The wide variation in topic-specific prevalence should stimulate educators to teach how SBS information can be used to promote healing and prevent relapse.

Study implications are relevant to improvements in SBS teaching in clinical education. The observational tool provides a structured and quantitative means of capturing core competencies in both clinical teaching and inpatient clinical care, along with SBS topics. Our study shows that higher patient-centeredness is associated with significantly more SBS content raised during attending rounds. While alternative tools to assess clinical performance during rounds do exist to inform teaching opportunities,[30,31] neither evaluates patient-centeredness nor quality of teaching. Direct observation paired with an assessment tool may be useful to evaluate and guide future clinical teaching efforts. This would require institutional buy-in, brief training surrounding use of the tool, and dedication of time to this endeavor. Currently, the Accreditation Council for Graduate Medical Education's Next Accreditation System emphasizes the use of improved evaluations and observations of the clinical learning environment incorporating SBS topics such as patient safety, quality, health care disparities, transitions in care and professionalism.[32]

A number of limitations pertain to our study. First, we only observed teams during attending rounds, which is a highly concentrated part of patient care and teaching but not the only opportunity. By potentially missing SBS topic discussions later in the day, our data may underestimate SBS topic count and topic prevalence. Second, we only recorded explicit, observable behavior and are unable to explain why topics were or were not raised; we did not factor in clinicians' rationales, priorities, or patient case-mix. For example, topics may have been intentionally excluded based on leaders' prior knowledge of team or patient needs. Consequently, we cannot provide a normative or prescriptive recommendation for the "correct" number of SBS topics that should be raised. Future studies might pair observations with post-round interviews with leaders and learners to explore rationales for behaviors. Although our multisite study included a private and public hospital and two medical services (IM and Peds), it is unclear if our findings are generalizable to other settings beyond the two institutions or the two specialties. Furthermore, our observational methodology is limited and may have introduced unintended bias. Although rounding teams were unaware of what behaviors were being observed, being observed in general may cause alterations in behavior

to be more socially desirable. Our findings, however, suggest they did not. We used the same behavioral anchors for attending and resident leaders, potentially creating unfair expectations for resident-led teams – more likely in Hospital 1 where more residents served as leaders. Although two independent trained raters came to consensus on learner- and patient-centered scores, initial inter-rater agreement was not calculated and interpersonal dynamics may affect the process of arriving at a consensus score. Finally, our observational tool was developed for research purposes to evaluate provider-level engagement with SBS topics, and did not include patient behaviors, perceptions of clinical care, or patient outcomes. While the codesheet could be adapted for the purposes of direct clinical observation and feedback, it was not developed with this intent.

Findings from this observational study suggest that within the constraints of busy inpatient services, teams can be patient- and learner-centered, and find time to address SBS topics. Our findings also highlight opportunities for improvement. While historically primary and ambulatory care have provided the primary pulpit for the promotion of a SBS focus, we have identified clear needs and deficiencies in the inpatient clinical setting. Initial reparative steps should include awareness raising to address missed opportunities to both teach and address SBS in the context of patient care, and educational campaigns to highlight the impact of the “soft” SBS topics on “hard” clinical outcomes. Beyond recognizing the crucial role that social and behavioral factors play in health and disease, inpatient clinician educators require appropriate training in areas such as cultural sensitivity, motivational interviewing, and behavior change counseling to optimally respond to SBS topics as they arise. Optimal teaching strategies and methods to shift inpatient teaching cultures should be developed, tested, and further refined. Moreover, future studies should assess patient- and learner-centered outcomes associated with skillful utilization of SBS concepts.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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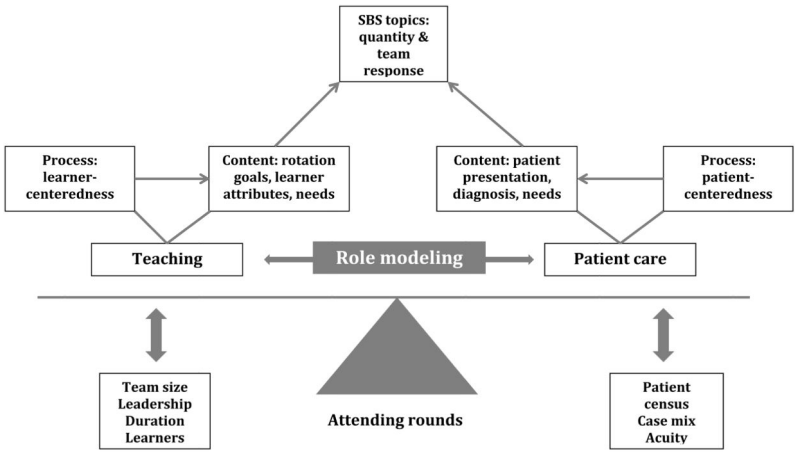

Figure 1.

Social and behavioral science topic quantity and team response are influenced by complex and often competing patient care and teaching demands during inpatient attending rounds, University of California, San Francisco, and Stanford Schools of Medicine, 2012. SBS indicates social and behavioral sciences.

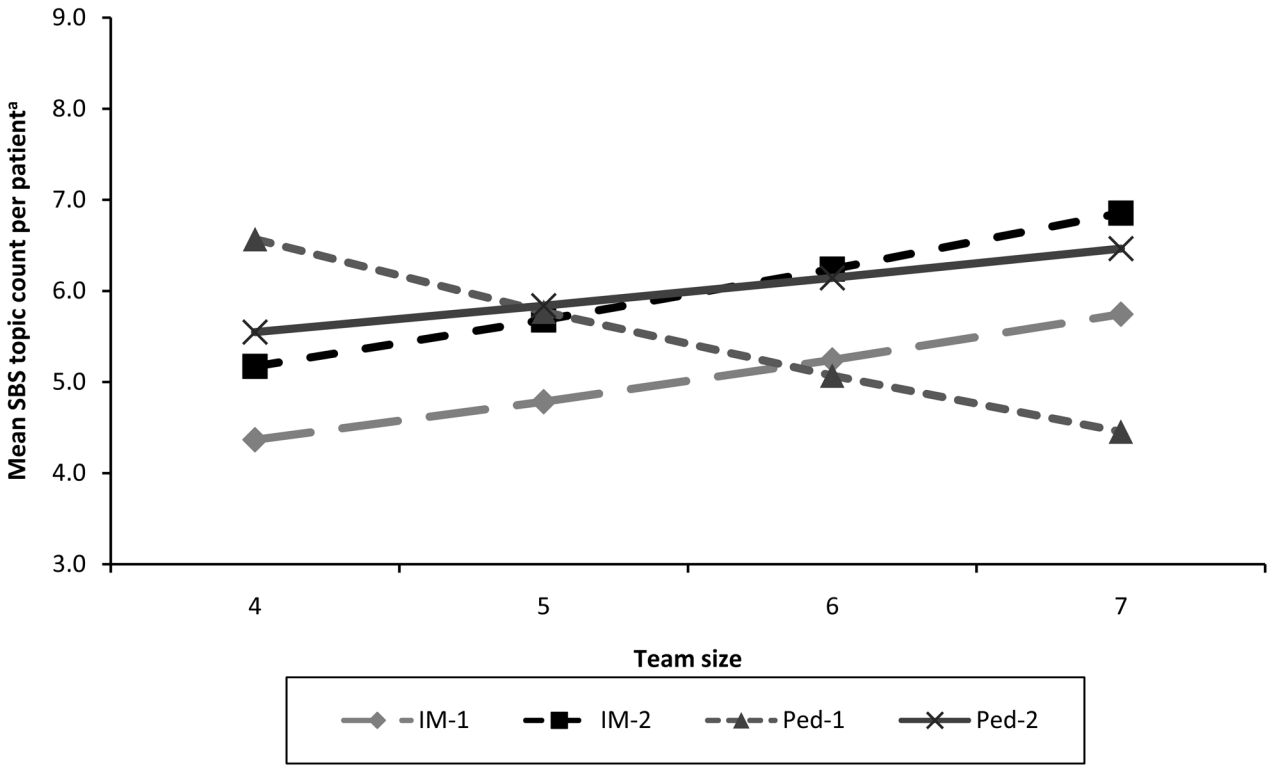

Figure 2.

Multivariable model shows that mean social and behavioral science topic count increased with additional team members for three services but decreased for one service, University of California, San Francisco, and Stanford Schools of Medicine, 2012. Abbreviations: SBS indicates social and behavioral sciences.

[a]For service seeing 8 patients in 2 hours, with mean patient-centered score of 2.8.

Table 1

Characteristics of Rounding Teams, by Service and Overall, from an Observational Study of Social and Behavioral Topics During Attending Rounds, University of California, San Francisco, and Stanford Schools of Medicine, 2012

Characteristic	IM-1 (T = 20)	IM-2 (T = 20)	Peds-1 (T = 20)	Peds-2 (T = 20)	All (T = 80)
Demographics					
Team size, median (IQR)	5.0 (4.0, 6.0)	5.0 (4.0, 5.5)	8.0 (7.0, 8.5)	7.0 (7.0, 8.0)	6 (5, 7.5)
Team composition, median number (median %)					
Trainer: attending, second- or third-year resident	2.0 (40.0)	2.0 (40.0)	2.0 (26.8)	2.0 (28.5)	2.0 (33.3)
Learner: first-year resident, third- or fourth-year medical student	2.0 (50.0)	3.0 (50.0)	4.0 (50.0)	4.0 (52.3)	3.0 (50.0)
Other healthcare professional: pharmacist, nurse, social worker, dietician, other	0.0 (0.0)	0.0 (0.0)	2.0 (20.0)	1.0 (16.7)	1.0 (14.3)
Team leader, number (%)					
Attending	3 (15)	19 (95)	2 (10)	14 (70)	38 (48)
Resident: second- or third- year	10 (50)	0 (0)	7 (35)	3 (15)	20 (25)
Attending + resident(s)	7 (35)	1 (5)	11 (55)	3 (15)	22 (28)
Caseload					
Patients per team, median (min, max)	7.0 (2, 7)	8.5 (4, 13)	9.0 (2, 13)	6.0 (4, 9)	8.0 (2, 13)
Duration of rounds in hours,[a] median (min, max)	2.3 (1.0, 3.5)	2.3 (1.0, 3.3)	2.0 (0.8, 2.5)	2.1 (1.0, 3.0)	2.0 (0.8, 3.5)
Minutes per patient, median (min, max)	21 (9, 36)	15 (7, 30)	12 (8, 22)	20 (15, 30)	17 (7, 36)
Learner-centered attributes, mean (SD)[b]					
Learning climate	3.90 (0.97)	3.60 (0.75)	3.15 (0.67)	3.75 (0.64)	3.60 (0.81)
Enhancing understanding	3.60 (0.82)	3.45 (0.89)	2.90 (0.55)	3.50 (0.76)	3.36 (0.80)
Promotes teamwork	3.20 (0.95)	3.10 (0.72)	3.20 (1.01)	3.05 (0.83)	3.14 (0.87)
Gives feedback	3.55 (0.83)	2.75 (0.85)	2.55 (0.61)	3.00 (0.73)	2.96 (0.83)
Communicates goals	2.60 (0.75)	2.85 (0.75)	2.25 (0.79)	3.10 (1.17)	2.70 (0.92)
Learner-centered composite	3.37 (0.71)	3.15 (0.61)	2.81 (0.56)	3.28 (0.63)	3.15 (0.65)
Patient-centered attributes, mean (SD)[b]					
Shows care/concern	3.65 (0.75)	3.40 (0.60)	3.30 (0.66)	3.55 (0.61)	3.48 (0.66)
Elicits information	3.15 (0.93)	3.10 (0.91)	2.90 (0.79)	2.85 (0.75)	3.00 (0.84)
Educates patient	2.90 (0.79)	2.85 (0.88)	2.65 (0.88)	2.95 (0.76)	2.84 (0.82)

Characteristic	IM-1 (T = 20)	IM-2 (T = 20)	Peds-1 (T = 20)	Peds-2 (T = 20)	All (T = 80)
Shares decision-making, process, and conclusions	2.90 (0.91)	2.80 (0.89)	2.55 (0.76)	2.80 (0.70)	2.76 (0.82)
Shares decision making, set-up	1.70 (0.87)	2.45 (0.76)	1.25 (0.55)	2.45 (0.83)	1.96 (0.91)
Patient-centered composite	2.86 (0.69)	2.92(0.55)	2.53(0.56)	2.92(0.49)	2.81(0.59)

Abbreviations: IM indicates internal medicine; Peds, pediatrics; IQR, interquartile range; T, number of team members; min, minimum; max, maximum.

[a]Duration of rounds was missing for 16 teams; all other covariates were not missing.

[b]Learner- and patient-centered items were rated on a 5-point Likert scale (range 1–5) with higher scores indicating better performance. Scores reported as mean (SD).

Table 2

Mean Prevalence of 30 SBS Topic Discussions During Ward Rounds, Expressed as Percentages, from an Observational Study of Social and Behavioral Topics During Attending Rounds, University of California, San Francisco, and Stanford Schools of Medicine, 2012[a]

Topic	Mean % per service[b]				Mean % (95% CI) per total (N = 622)[b]	*P* value
	IM-1 (N = 140)	IM-2 (N = 171)	Peds-1 (N = 186)	Peds-2 (N = 125)		
Health behaviors						
Nutrition/diet	42.9	38.9	52.8	78.2	53.2 (48.1–58.6)	< .001
Medical adherence						
Referral	36.3	29.4	40.5	40.0	36.3 (30.8–42.3)	.56
Medications	36.2	27.3	23.4	21.4	27.1 (22.0–32.1)	.19
Chronic disease management	35.4	20.4	20.7	15.2	22.9 (17.7–28.2)	.055
Tests/procedures	24.8	15.3	14.0	26.5	20.2 (15.7–24.6)	.12
Primary care follow-up	20.4	10.6	3.8	16.3	12.8 (9.1–16.4)	.012
Exercise	16.4	24.6	11.9	32.7	21.4 (18.1–24.7)	<.001
Home patient safety	23.3	8.1	9.5	11.1	13.0 (9.6–16.3)	.008
Alcohol	9.8	15.3	0.5	0.0	6.4 (4.3–8.5)	<.001
Drugs	9.3	8.9	1.1	3.2	5.6 (3.6–7.6)	.007
Prevention/screening	0.7	3.5	2.2	12.0	4.6 (3.0–6.2)	<.001
Smoking	7.6	10.4	0.0	0.7	4.7 (2.7–6.6)	<.001
Unsafe sexual behavior	0.7	1.2	0.5	2.4	1.2 (0.4–2.1)	.46
Any health behavior topic	82.8	86.6	85.5	97.6	87.6 (--)	--
Social/cultural factors						
Social supports	43.5	52.2	39.4	74.1	52.3 (46.8–57.8)	<.001
Resources	46.5	47.1	31.8	32.0	39.4 (34.6–44.1)	.023
Language	12.2	8.5	9.4	27.8	14.5 (11.4–17.6)	<.001
Socioeconomic status	9.5	11.6	2.7	4.1	7.0 (4.8–9.2)	.011
Literacy	5.8	3.7	3.3	11.1	6.0 (3.3–8.7)	.17
Race/ethnicity/cultural	6.6	5.1	5.0	5.7	5.6 (3.5–7.6)	.95
Gender/sexual orientation	0.0	3.6	0.5	2.7	1.7 (0.3–3.1)	.23

Topic	Mean % per service[b]				Mean % (95% CI) per total (N = 622)[b]	*P* value
	IM-1 (N = 140)	IM-2 (N = 171)	Peds-1 (N = 186)	Peds-2 (N = 125)		
Spirituality	2.9	0.6	0.0	0.8	1.1(0.3–1.8)	.069
Any social/cultural topic	67.1	70.2	59.1	86.4	69.4 (--)	--
Mind/body factors						
Pain	57.8	67.7	36.6	84.7	61.7 (56.8–66.6)	<.001
Stress	24.2	14.5	12.3	28.8	19.9 (16.2–23.7)	.008
Psychiatric illness	18.3	7.8	9.0	8.7	10.9 (8.1–13.7)	.038
Integrative medicine (CAM)	1.4	3.4	0.0	13.4	4.5 (2.9–6.2)	<.001
Any mind/body topic	67.1	73.1	44.6	89.6	66.6 (--)	--
Behavior change counseling						
Patient education	26.2	25.3	23.4	49.1	31.0 (25.8–36.2)	.003
Goal setting	3.9	34.6	2.2	51.9	23.2 (18.7–27.6)	<.001
Assess readiness/enhance motivation	5.4	24.9	2.0	44.8	19.3 (14.3–24.3)	<.001
Shared problem solving	5.8	21.9	1.6	25.1	13.6 (9.9–17.3)	<.001
Self-monitoring	3.8	7.3	5.2	8.8	6.3 (3.9–8.7)	.50
Any behavior change topic	29.3	57.9	26.9	85.6	47.8 (--)	--
Any SBS topic	97.9	98.8	94.1	98.4	97.1 (--)	--

Abbreviations: SBS indicates social and behavioral sciences; IM, internal medicine; Peds, pediatrics; N, number of patients; CAM, complementary and alternative medicine.

[a]Prevalence (mean frequency) per service was estimated using hierarchical models with team (T = 80) as a random effect and patients (N = 622) nested within teams.

[b]N indicates the patient census across 20 teams per service.

Table 3

Unadjusted Mean SBS Topic Count and SBS Positive-Response Rate, at Selected Levels of Team Characteristics, from an Observational Study of Social and Behavioral Topics During Attending Rounds, University of California, San Francisco, and Stanford Schools of Medicine, 2012[a]

Team characteristic	SBS topic count (Pt) mean (95% CI)	SBS positive-response rate (Pt) mean (95% CI)
Overall	5.32 (5.00–5.67)	37.9 (33.7–42.2)
Service	*P* < .001 (3)	*P* = .54 (3)
IM-1	5.38 (4.69–6.18)	39.7 (30.5–49.7)
IM-2	5.54 (4.86–6.32)	41.3 (31.9–51.4)
Peds-1	3.67 (3.15–4.27)	32.2 (24.7–40.8)
Peds-2	7.33 (6.92–7.77)	38.5 (33.3–44.0)
Team leader	*P* = .14 (2)	*P* = .87 (2)
Attending	5.91 (5.41–.45)	38.6 (32.7–45.0)
Resident(s)	5.04 (4.21–6.04)	40.1 (31.4–49.4)
Both	5.04 (4.22–6.02)	36.8 (29.2–45.1)
Team size	*P* = .026 (1) [b]	*P* = .84 (1)
3	4.44 (3.83–5.14)	42.9 (31.9–54.6)
5	5.67 (5.17–6.22)	40.0 (34.0–46.4)
7	5.82 (5.33–6.35)	37.3 (33.2–41.6)
9	4.79 (3.70–6.22)	34.6 (27.3–42.8)
Learners on team, %	*P* = .068 (1)	*P* = .53 (1)
20%	4.56 (3.88–5.37)	42.5 (29.4–56.8)
40%	5.14 (4.71–5.60)	39.8 (33.5–46.5)
60%	5.78 (5.24–6.39)	37.2 (32.1–42.5)
Patients per team	*P* < .001 (1)	*P* = .076 (1)
3	7.34 (6.38–8.43)	45.4 (37.0–54.1)
6	6.11 (5.63–6.63)	40.9 (36.1–46.0)
9	5.09 (4.69–5.52)	36.6 (32.1–41.3)
12	4.24 (3.68–4.88)	32.4 (25.5–40.3)
Duration of rounds, hours	*P* = .046 (1) [b]	*P* = .99 (1)

Team characteristic	SBS topic count (Pt) mean (95% CI)	SBS positive-response rate (Pt) mean (95% CI)
1.0	5.59 (4.21–7.42)	37.5 (29.3–46.6)
1.5	5.10 (4.48–5.79)	37.5 (31.6–43.8)
2.0	5.09 (4.66–5.56)	37.5 (33.3–41.9)
2.5	5.59 (5.09–6.13)	37.5 (33.0–42.2)
3.0	6.72 (5.97–7.57)	37.4 (31.1–44.3)
Mean time per patient, minutes	*P* < .001 (1)	*P* = .13 (1)
12	4.64 (4.22–5.09)	34.1 (28.6–40.0)
18	5.52 (5.16–5.89)	37.1 (33.2–41.3)
24	6.57 (6.05–7.13)	40.2 (35.2–45.5)
30	7.82 (6.89–8.87)	43.3 (35.4–51.8)
Patient-centeredness, mean	*P* < .001 (1)	*P* = .13 (1)
2	4.27 (3.79–4.82)	33.7 (27.6–40.2)
3	5.68 (5.29–6.09)	39.0 (34.8–43.4)
4	7.54 (6.61–8.60)	44.6 (36.5–53.1)
Learner-centeredness, mean	*P* = .010 (1)	*P* = .98 (1)
2	4.48 (3.80–5.27)	38.4 (30.1–47.4)
3	5.28 (4.85–5.75)	38.5 (34.0–43.1)
4	6.23 (5.69–6.81)	38.5 (32.4–45.0)

Abbreviations: SBS indicates social and behavioral sciences; IM, internal medicine; Peds, pediatrics.

[a] Statistically significant chi-squared tests (*P* value; df) indicate outcomes that vary among levels of the characteristic. Estimates and chi-squared tests are based on hierarchical models with team members (T = 80) as a random effect and patients (N = 622) nested within teams. DF > 1 indicates covariate was modeled as a categorical variable.

[b] Covariate was modeled as a quadratic effect; p-value for quadratic term shown.

Table 4

Mean (95% CI) Topic Positive-Response Rates for 30 SBS Topics and Number Of Teams (T) Contributing to the Estimate, by Service and Overall, Expressed as Percentages,[a] from an Observational Study of Social and Behavioral Topics During Attending Rounds, University of California, San Francisco, and Stanford Schools of Medicine, 2012

	Service				Total		
Topic	**IM-1 rate (T)**	**IM-2 rate (T)**	**Peds-1 rate (T)**	**Peds-2 rate (T)**	**Rate (T)**	**95% CI**	**GEE *P* value (3 DF)**
Health behaviors							
Nutrition/diet	53.1 (18)	33.3 (20)	42.7 (20)	37.7 (20)	41.5 (78)	34.5–48.9	0.29
Medical procedure adherence:							
Referral	26.5 (17)	32.7 (17)	5.3 (15)	28.0 (18)	19.9 (67)	14.0–27.6	0.012
Medications	21.6 (16)	42.9 (17)	20.0 (14)	40.7 (14)	30.3 (61)	21.8–40.3	0.12
Chronic disease management	24.0 (14)	35.2 (16)	32.5 (12)	47.4 (10)	34.3 (52)	25.8–43.9	0.45
Tests/procedures	27.8 (15)	32.1 (12)	3.7 (12)	29.4 (14)	18.9 (53)	11.8–28.7	0.050
Primary care follow-up[b]	33.3 (13)	60.6 (11)	0.0 (4)	44.2 (12)	40.1 (40)	27.5–54.1	0.090
Exercise	56.5 (13)	33.3 (17)	40.9 (14)	29.3 (18)	39.6 (62)	29.8–50.4	0.31
Home patient safety	35.5 (14)	42.9 (9)	41.2 (12)	50.0 (12)	42.3 (47)	31.4–54.0	0.88
Alcohol [b]	13.3 (9)	38.1 (15)	0.0 (1)	-- (0)	27.9 (25)	14.6–46.7	0.30
Illicit drugs	30.8 (9)	13.3 (10)	50.0 (2)	50.0 (4)	33.8 (25)	16.6–56.9	0.38
Prevention/screening [b]	100.0 (1)	50.0 (6)	0.0 (4)	67.5 (11)	52.8 (22)	31.7–73.0	0.10
Smoking [b]	9.1 (7)	16.7 (9)	– (0)	0.0 (1)	13.4 (17)	5.2–30.3	0.58
Unsafe sexual behavior [b,c]	100.0 (1)	0.0 (2)	0.0 (1)	0.0 (3)	14.3 (7)	--[c]	--
Socio-cultural							

Topic	Service				Total		GEE
	IM-1 rate (T)	IM-2 rate (T)	Peds-1 rate (T)	Peds-2 rate (T)	Rate (T)	95% CI	*P* value (3 DF)
Social supports	55.2 (19)	37.8 (19)	15.3 (18)	9.7 (19)	25.7 (75)	20.5–31.7	< 0.001
Resources	60.0 (20)	42.0 (18)	36.2 (20)	32.5 (17)	42.5 (75)	35.3–50.0	0.10
Language	35.3 (9)	50.0 (8)	29.4 (11)	45.7 (16)	39.8 (44)	29.0–51.8	0.63
Socioeconomic status	7.7 (10)	30.0 (11)	20.0 (4)	20.0 (5)	17.9 (30)	7.6–36.4	0.37
Literacy	71.4 (5)	66.7 (6)	33.3 (5)	64.3 (6)	59.3 (22)	40.2–76.0	0.46
Race/ethnicity/cultural	55.6 (8)	44.4 (7)	11.1 (5)	28.6 (6)	32.1 (26)	18.2–50.2	0.20
Gender/sexual orientation [b,c]	-- (0)	33.3 (3)	0.0 (1)	66.7 (3)	33.3 (7)	--[c]	--
Spirituality [b]	50.0 (4)	0.0 (1)	-- (0)	100 (1)	50.0 (6)	9.1–90.9	0.54
Mind/body							
Pain	45.0 (20)	27.0 (19)	43.5 (18)	15.1 (20)	31.1 (77)	25.7–37.0	< 0.001
Stress	26.5 (16)	33.3 (14)	56.5 (13)	34.3 (16)	37.2 (59)	28.5–46.7	0.28
Psychiatric illness	44.0 (14)	61.5 (11)	52.9 (10)	54.5 (7)	53.3 (42)	39.4–66.7	0.84
Integrative medicine (CAM) [b]	100 (2)	25.0 (4)	-- (0)	27.3 (11)	35.3 (17)	18.1–56.4	–
Behavior change counseling							
Patient education	66.7 (14)	73.2 (13)	42.9 (15)	71.7 (20)	64.2 (62)	54.0–73.3	0.23
Goal setting [b]	50.0 (3)	47.6 (17)	100.0 (4)	44.4 (19)	48.6 (43)	37.8–59.5	0.23
Assess readiness/enhance motivation	37.5 (7)	51.3 (15)	50.0 (4)	40.2 (16)	44.6 (42)	29.2–61.2	0.82
Shared problem solving	16.7 (5)	61.1 (15)	66.7 (3)	84.4 (13)	57.6 (36)	36.0–76.6	0.079
Self-monitoring	40.0 (5)	58.3 (8)	22.2 (5)	54.5 (8)	42.9 (26)	27.2–60.2	0.30

Abbreviations: SBS indicates social and behavioral sciences; IM, internal medicine; Peds, pediatrics; GEE; generalized estimating equation; T, number of team members; CAM, complementary and alternative medicine.

[a] Also shown are statistical significance of variation in rates among services (*P* values). Topic response per service was estimated using hierarchical models with team (T = 80) as a random effect and patients (N = 622) nested within teams. T = 0 indicates that no team per service discussed that topic and the mean is indicated with a dash.

[b] Service-specific rates and statistical significance are estimated using the normal distribution, while overall rates are estimated using the binomial distribution. For topics not flagged, both overall and service-specific rates are estimated using the binomial distribution.

[c] 95% CI could not be calculated using binomial distribution.

For nine topics, for which all (or no) service-specific topic responses were positive, only the overall mean (95% CI) topic response could be estimated using a binomial assumption; service-specific means were estimated assuming normal distributions to achieve model convergence. Estimates are reported as percentages.