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Coaching older adults discharged home from the emergency department: The role of competence and emotion in following up with outpatient clinicians

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ABSTRACT

Objective: Motivating older adults to follow up with an outpatient clinician after discharge from emergency departments (ED) is beneficial yet challenging. We aimed to answer whether psychological needs for motivation and discrete emotions observed by care transition coaches would predict this behavioral outcome.
Methods: Community-dwelling older adults following ED discharge were recruited from three EDs in two U.S. states. We examined home visit notes documented by coaches (N = 725). Retrospective chart reviews of medical records tracked participants' health care utilization for 30 days.
Results: Observed knowledge-based competence predicted higher likelihood of outpatient follow-up within 30 days, while observed sadness predicted a lower likelihood of follow-up within seven days following discharge. Moreover, participants who demonstrated happiness were marginally more likely to have an *in-person* follow-up within seven days, and those who demonstrated knowledge-based competence were more likely to have an *electronic follow-up* within 30 days.
Conclusions: Knowledge-based competence and emotions, as observed and documented in coach notes, can predict older adults' subsequent outpatient follow-up following their ED-discharge.
Practice implications: Intervention programs might encourage coaches to check knowledge-based competence and to observe emotions in addition to delivering the content. Coaches could also customize strategies for patients with different recommended timeframes of follow-up.

1. Introduction

Older adults frequently use the emergency department (ED) for care, with 43 ED visits for every 100 persons age 60 and over annually in the U.S. [1]. Older adult ED patients have higher rates of return ED visits, subsequent hospitalization, and mortality compared to younger populations. Recent studies have shown that approximately 20-25% of older adult patients return to the ED within one month following discharge [2–4].

Researchers and practitioners have identified the ED-to-home

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transition process as a key target for interventions to mitigate negative post-discharge outcomes [5,6]. The ED discharge process, during which care instructions (e.g., medications, treatment plans, follow-up appointments) are delivered to patients in verbal and written form, lasts four minutes on average [7]. Older adults often leave the ED without completely understanding healthcare-related behaviors they need to perform at home [8,9].

To improve the ED-to-home transition experience without creating additional burden or workload for clinicians, researchers adapted a validated care transition intervention (CTI) [10,11] for use following ED discharge [12,13]. During home visits, when intervention content is initially delivered, trained community paramedic "coaches" employ communication strategies to address self-management behaviors integral to successful care transitions. Although the CTI has shown effectiveness in improving health outcomes, it remains unclear how the coaching process itself motivates people to make changes and take actions. Narrative records of the interactions, such as free-text coach notes, may provide details of the coaching session. They are also a highly valuable source for understanding the ways in which older adults convey their desire, willingness, and motivation to engage in related care transition self-management behaviors.

In this study, we conducted a structured content analysis of free-text notes documented by paramedic coaches after home visits with older adult patients post-ED discharge. We tracked patient healthcare utilization for one month (within 7 days and 30 days, respectively) after ED discharge to see if patients followed up with an outpatient clinician, which is a standard discharge instruction in geriatric emergency medicine [14]. The aim is to examine what psychological needs and emotions observed and documented by the coaches predict subsequent utilization of outpatient clinical care by older adults receiving the CTI after ED discharge. This will provide valuable insights to guide health communication practices and future interventions following the ED encounter.

1.1. Self-determination theory

Self-determination theory (SDT) provides an explanation for human tendencies toward active engagement and demonstrates different types of motivations with varying degrees of behavioral regulation on a spectrum [15,16]. According to SDT, three basic needs—autonomy, competence, and relatedness—must be fulfilled in order to obtain motivation relatively free of external control [16]. Autonomy speaks to the perception of being the origin or source of one's own actions. Competence refers to feeling effective in one's ongoing interactions with the social environment where opportunities for expressing one's capacity are given. Relatedness means feeling bonded and connected with other individuals and the community. Satisfying these needs is fundamental to motivating an individual to act toward a desirable goal [17] and serves an important role in activating and maintaining motivated behavioral change[18]. Our first set of hypotheses connect psychological needs for motivation and post-discharge outpatient follow up. To further refine competence, we distinguished between knowledge-based competence, which should enhance motivation, and impaired ability, that may hinder gaining new knowledge, skills, and abilities [19].

H1. : Participants who demonstrated autonomy regarding health management during the coaching process were more likely to follow up with a clinician within 7 days and 30 days of ED discharge.

H2. : Participants who demonstrated knowledge-based competence (a) or no impaired ability (b) regarding health management during the coaching process were more likely to follow up with a clinician within 7 days and 30 days of ED discharge.

H3. : Participants who demonstrated more relatedness regarding health management during the coaching process were more likely to follow up with a clinician within 7 days and 30 days of ED discharge.

1.2. Emotions and action

Emotions, or individual affective states, have also been shown to be a precursor for intrinsic motivation [20,21], and motivation in general [22,23]. In other words, not only do emotions affect intrinsic motivation to engage in a pleasant task, but they make people continue to work longer on less pleasant tasks and even self-regulate behaviors to complete an uninteresting task that has to be done in a responsible manner [20]. This study focused on four emotion exemplars selected from a list of well-studied discrete emotions [24], operationalizing them in terms of valence and arousal level as consistent with prior research [25–27]: happiness (positive valence, high arousal), calm (positive valence, low arousal), anxiety (negative valence, high arousal), and sadness (negative valence, low arousal). Emotions with positive valence have been found to increase active engagement with positive goals that, in turn, lead to desirable outcomes [28], while negative emotions might decrease the likelihood of engaging in a target behavior [29]. Below we connect emotions to post-discharge outpatient follow-up.

H4. : Participants who demonstrated emotions of happiness (a) or calm (b) during the coaching process were more likely to follow up with a clinician within 7 days and 30 days of the ED discharge.

H5. : Participants who demonstrated emotions of anxiety (a) or sadness (b) during the coaching process were less likely to follow up with a clinician within 7 days and 30 days of the ED discharge.

2. Methods

2.1. Study setting

This study analyzed data from the intervention arm of a randomized controlled trial (clinicaltrials.gov: NCT02520661) examining the effectiveness of an adapted CTI intervention at improving ED-to-home transitions for community-dwelling older adults following discharge [12,13]. Participants received a home visit conducted by highly-trained paramedic coaches 24–72 h after ED discharge. These paramedics were used because they are highly skilled, experienced at working with patients in their homes, embraced within their communities, and staffed regardless of day of week, time of day, or location. Coaches utilized motivational interviewing techniques, behavior modeling, skill transfer, and role playing to help participants achieve their health goals. CTI content focused on the adoption of four self-management behaviors: 1) prompt scheduling of outpatient follow-up appointments, 2) medication reconciliation, 3) knowledge of "red flag" symptoms necessitating further care, and 4) creation of a personal health record for use in future healthcare appointments. Coaches maintained visit details using both structured (e.g., visit-related logistics, checklists of services delivered) and free-text forms. The study was approved by Institutional Review Boards at both study sites. Data were collected from 2016 to 2019.

2.2. Participants

Participants were recruited from three EDs of urban hospitals located in two U.S. states (one Midwest and one Northeast). Research associates screened and consented eligible patient subjects during ED visits. Eligible participants had to be at least 60 years of age, community dwelling, have a primary care provider affiliated with either health system, have a working telephone, and be discharged from the ED to a community residence within 24 h of arrival. Subjects were excluded if they did not speak English, were visually or hearing impaired, did not have a permanent residence, were actively enrolled in either hospice, a transitions program, or a care management program, presented with a primary behavioral or psychiatric problem, or had an Emergency Severity Index category of 1 (highest level of acuity [30]). Participants who consented to study participation were randomly assigned to either a control (usual care) or treatment (care transitions intervention)

condition prior to ED discharge.

Of the 725 participants[1] who received the home visit, 389 (53.5 %) were female with an average age of 72.84 ($SD = 8.65$). Nine participants (1.2 %) were of Hispanic or Latino origin. The majority indicated that they were White, $N = 680$ (93.8 %). More than half were married, $N = 426$ (58.8 %), and received a college degree, $N = 453$ (62.5 %). Complete data was obtained for 95.9 % of intervention participants. This analysis does not include participants randomized to the control condition, as they did not receive the coaching intervention.

2.3. Data collection

The baseline survey was delivered verbally during the initial ED visit to collect self-report data such as demographic information and perceived health status. Trained researchers performed retrospective chart reviews of medical records to identify chronic conditions at the time of enrollment and abstract data on all participants' interactions with the health care system during the 30-day study period. Best practices for reducing potential bias in chart abstraction were employed [31].

Coaches documented detailed notes during home visits.[2] These free-text notes specified the participant's personal goals and documented interactions regarding each of the four key self-management behaviors (i.e., outpatient follow-up, medication, red flags, and personal health record). Coaches also documented other observations, such as participants' emotions, behaviors, and household environment, in addition to relevant anecdotes and life events disclosed during the visit.

2.4. Notes coding and inter-coder reliability

All coach-collected data were typed verbatim into a secured database, de-identified, and transferred to Microsoft Access for coding. An initial 5 % of the note sample was used for developing a coding manual. Two coders then trained on 30 % of the note sample to reach consistency, discussed and resolved disputes, and revised the coding manual accordingly. Inter-coder reliability was then calculated using another 30 % of the sample (measured as Cohen's κ on each independent variable). The two coders independently read and coded the remaining note sample. Specifically, coders captured whether the three psychological needs for motivation (autonomy, competence, and relatedness) were indicated in coach notes based upon coding manual definitions. The presence of the four observed emotions (happiness, calm, sadness, and anxiety) were also coded based upon coding manual definitions.

2.4.1. Psychological precursors of motivation

The observation of motivation precursors—the need for autonomy, competence, and relatedness—was coded from coach notes as our first set of independent variables (average Cohen's $\kappa = 0.92$).

Autonomy is defined as perceiving oneself as the origin or source of one's own action, and was operationalized as a dichotomous variable indicating whether or not the coaches described the participant as self-governed in managing their own health without external control (outside pressures, coercions, etc.). Specifically, autonomy was coded as present when participant had control in pursuing a goal or taking actions (e.g., "He was attempting to write out some of these things to help later management," "She was on top of her medications," "She designed her own workout plan, as her goal is to lose weight"). When full reliance on a caregiver was observed, autonomy was coded as absent (e.g., "Her son takes care of everything and she does not bother going over those").

Competence is defined as feeling effective in expressing one's capacity, and was operationalized into two categories: knowledge-based competence and impaired ability. Knowledge-based competence was coded as whether the participant demonstrated sufficient knowledge about how to manage their health (e.g., "Patient had a good understanding of his meds," "She understands red flags and has a good sense of what to look at"). Impaired ability was dichotomously coded as whether or not the participant had any physical, functional, or psychological issues potentially hindering their ability to manage their health (e.g., "The patient is wheelchair bound and can't leave his wife for a few hours," "He struggled to find his medications at the start of visit," "She states she does tend to get really anxious at times which causes her to have difficulty when needing to make health decisions").

Relatedness is defined as feeling bonded or connected with other individuals and the community, and was measured as the sum of three dichotomously-coded variables: whether or not the participant received support from 1) immediate family members, such as spouse, partner, children, or siblings (e.g., "She's very close with her husband and kids and gets lots of support from them"); 2) the network beyond families (e.g., "He said he has lots of help from friends"); and 3) an online network (e.g., "She goes to the Michael J Fox website for exercises instructions specifically targeted for Parkinson's Disease"). Scores ranged from 0 to 3, with higher scores indicating greater levels of perceived relatedness.

2.4.2. Emotions

Observations of four emotions were also coded from coach notes (average Cohen's $\kappa = 0.93$).

Happiness is conceptualized as a positive emotion with high arousal and was dichotomously coded as present when "happy" or its variations and synonyms appeared in the notes, clearly indicating one's pleasure (e.g., "a great joy," "with delight," "cheerful," "excitement").

Calm is conceptualized as a positive emotion with low arousal, and was dichotomously coded as present based on the appearance of "calm" or its variations and synonyms, indicating one's peaceful state (e.g., "relaxed," "Patient met me in the driveway who is calm and friendly," "She enjoys crochet, 'a peaceful hobby'").

Anxiety is conceptualized as a negative emotion with high arousal, and was dichotomously coded as present when "anxious" or its variations and synonyms (e.g., "nervous," "worry about") appeared, indicating that an individual's uneasiness or uncertainty about current or future situations has caused high levels of concern.

Sadness is conceptualized as a negative emotion with low arousal, and was dichotomously coded as present when "sad" or its variations and synonyms appeared in the notes, clearly indicating feeling down or depressed (e.g., "The patient was really sad about her diagnosis," "She is clearly still grieving the loss of her husband and seems rather isolated and depressed").

2.5. Measures

2.5.1. Outcome variables

2.5.1.1. 7- and 30-day outpatient follow-up. 7- and 30-day outpatient follow-up. Outpatient follow-up is defined as an interaction between the patient and an outpatient health care provider, including in-person office visits with primary or specialty care providers, telephone calls with clinic staff/providers, and online patient portal messaging. Data were abstracted from participants' medical records to determine whether follow-up occurred within the 7- and 30-day following ED discharge. Each instance of follow-up was categorized either as an in-person clinic visit ("*in-person follow-up*") or electronic communication ("*electronic follow-up*") with a member of the clinical team. Clinic-generated messages that did not receive a participant response were excluded.

[1] The intervention group was comprised of 863 older adults, all of whom were scheduled upon ED discharge to receive the coaching home visit. Of this number, 726 completed the home visit. One additional participant was excluded after withdrawing prior to final chart review data collection.

[2] The intervention also included up to three telephone follow-up calls during 30-day study period, but the present paper only looked at notes from the initial home visit.

Telemedicine was not available during the study period. Outcomes were dichotomously coded for each modality (in-person or electronic) as well as for having any type of clinical contact (all-contact), for both the 7 and 30-day time periods.

2.5.2. Control variables

2.5.2.1. Demographic characteristics. Age, gender, education, ethnicity group, race, marital status, and study site were collected during the initial ED survey and medical record review.[3]

2.5.2.2. Health status. Three measures were used to assess participant's baseline health status, using both self-report and chart review measures.

2.5.2.3. Activities of daily living (ADL). Participants' self-reported deficiencies in activities of daily living (i.e., bathing, dressing, eating, getting out of chairs, walking, and using the toilet) were totaled to measure their overall functional limitation, with scores ranging from 0 to 6 [32].

2.5.2.4. Self-rated health status. Participant health status was assessed using both subscales of the 12-item Short-Form Health Survey (physical and mental health), with possible scores ranging from 0 to 100 on each scale [33].

2.5.2.5. Chronic conditions (CC). Participants' baseline conditions were abstracted from medical records. Number of chronic conditions was calculated consistent with the Charlson Comorbidity Index [34].

2.6. Analytical approach

We conducted hierarchical logistic regression analyses predicting whether participants followed up with a clinician within 7 days and 30 days of ED discharge. We first controlled for demographic and health status variables to account for their potential impact on follow-up. Next, we regressed predictor variables from coach notes on outpatient follow-up outcomes to test our hypotheses. Descriptive statistics for health status variables and predictors are provided in Table 1.

The same set of control variables and predictors were regressed on each of the four other outcome variables: in-person follow-up within 7 days, electronic follow-up within 7 days, in-person follow-up within 30 days, and electronic follow-up within 30 days. Significance was determined using $p < .05$. We also report results trending towards significance at the $p < .10$ level, but these associations should be interpreted with caution.

Table 1
Descriptive statistics for health status, observed needs for motivation, and emotions.

	N = 725
Deficiencies in ADL (mean (SD))	0.8 (1.27)
Physical health (mean (SD))	43.18 (11.59)
Mental health (mean (SD))	54.06 (8.68)
Number of chronic conditions (mean (SD))	2.75 (1.63)
Autonomy (n (%))	688 (94.9)
Knowledge-based competence (n (%))	489 (67.4)
Impaired ability (n (%))	143 (19.7)
Relatedness (mean (SD))	0.5 (0.63)
Sadness (n (%))	27 (3.7)
Anxiety (n (%))	79 (10.9)
Happiness (n (%))	31 (4.3)
Calm (n (%))	316 (43.6)

Note. ADL = Activities of daily living

[3] Details of these measures have been previously published [12,13].

3. Results

The majority of follow-up occurred within 7 days after the ED discharge, with increases occurring over the remainder of the 30-day period. Table 2 shows the count of participants who had any in-person, electronic, or all-contact follow-up within 7 days and 30 days.

For all-contact follow-up (Table 3), knowledge-based competence trended toward significance at 7 days, OR = 1.54, 95 % CI = [0.99, 2.38], $p = .055$, and significantly predicted follow-up within 30 days, OR = 2.15, 95 % CI = [1.20, 3.85], $p = .010$. Sadness significantly predicted all-contact follow-up within 7 days, OR = 0.37, 95 % CI = [0.15, 0.96], $p = .033$.

For in-person follow-up (Table 4), happiness trended toward significance in predicting follow-up within 7 days, OR = 2.10, 95 % CI = [0.94, 5.06], $p = .081$. In-person follow-up within 30 days, however, was not significantly predicted by any coded variables from coach notes.

For electronic follow-up (Table 5), knowledge-based competence significantly predicted follow-up within 30 days, OR = 1.59, 95 % CI = [1.04, 2.42], $p = .032$. Electronic follow-up within 7 days, however, was not significantly predicted by any coded variables from coach notes. Collectively, these results provided partial support for H2, H4, and H5, while not offering support for H1 and H3.

2. Discussion and conclusion

2.1. Discussion

This study analyzes the coach notes from an ED-to-home transition intervention to examine whether observed psychological needs and emotions predict older adults' follow-up with an outpatient clinician within 7 days and 30 days. We found that after being discharged from ED, participants documented in the coach notes as having sufficient knowledge about how to manage their health during the coach visit were more likely to follow up with a clinician within 30 days than those lacking knowledge. Participants documented as showing sadness during the coach visit, however, were less likely to follow up with a clinician within 7 days compared to those without documented sadness. In line with these main findings, our results regarding communication modes further revealed that participants with demonstrated happiness in the coach notes were more likely to have an *in-person visit* within 7 days, and participants documented as having sufficient knowledge were more likely to have *electronic contact* within 30 days than those who did not.

In the context of ED-to-home transitions, motivating older patients to have timely follow-up with outpatient clinicians is crucial since it has been associated with benefits such as reducing adverse events and improving health outcomes [35,36]. Healthcare experts in geriatric emergency medicine have recommended prompt outpatient follow-up as an essential element of ED discharge instructions to promote post-ED care continuity. Communicating with outpatient clinics as soon as possible after discharge facilitates the ability of primary and specialty care providers to actively monitor and treat ongoing symptoms, potentially avoiding the need for additional acute care services [14,37]. However, obtaining this care remains challenging for older adults—a vulnerable population that typically has low follow-up rates post-ED

Table 2
Count of participants who had any clinician follow-up within 7 or 30 days of ED discharge (N = 725).

	Within 7 days	Within 30 days
In-person follow-up	385 (53.10 %)	591 (81.52 %)
Electronic follow-up	445 (61.38 %)	547 (75.45 %)
All-contact follow-up	561 (77.38 %)	652 (89.93 %)

Table 3
Logistic regression models predicting all-contact follow-up with a clinician within 7 and 30 days of ED discharge (N = 695).

	All-contact follow-up within 7 days		All-contact follow-up within 30 days	
	Odds ratio	95 % CI	Odds ratio	95 % CI
Block 1: Control variables				
Age	1.00	[0.98, 1.03]	1.03	[0.99, 1.06]
Gender[a]	0.88	[0.59, 1.31]	1.01	[0.58, 1.74]
Education[b]	1.06	[0.71, 1.59]	1.33	[0.77, 2.28]
Ethnicity[c]	0.36	[0.02, 2.29]	0.87	[0.04, 6.41]
Race[d]	1.81	[0.83, 3.80]	1.06	[0.32, 2.90]
Marital status[e]	1.62 *	[1.08, 2.44]	1.05	[0.59, 1.83]
Study site[f]	3.30 ***	[2.20, 5.03]	4.97 ***	[2.69, 9.82]
ADL	0.80 *	[0.67, 0.97]	0.81	[0.63, 1.05]
Physical health	0.99	[0.97, 1.01]	0.97 *	[0.94, 0.10]
Mental health	0.99	[0.97, 1.02]	1.00	[0.97, 1.04]
CC	1.28 ***	[1.12, 1.47]	1.24 *	[1.03, 1.51]
Block 2: Predictors				
Autonomy	1.58	[0.62, 3.81]	0.89	[0.19, 3.05]
Knowledge-based competence	1.54†	[0.99, 2.38]	2.15 **	[1.20, 3.85]
Impaired ability	0.81	[0.50, 1.36]	0.92	[0.47, 1.91]
Relatedness	1.10	[0.80, 1.53]	1.01	[0.65, 1.60]
Happiness	1.19	[0.45, 3.82]	1.00	[0.27, 6.52]
Calm	1.13	[0.75, 1.71]	1.28	[0.73, 2.26]
Anxiety	1.09	[0.58, 2.14]	1.00	[0.43, 2.65]
Sadness	0.37 *	[0.15, 0.96]	0.36	[0.12, 1.39]

Note. [a]1 =Female, 2 =Male. [b]1 =Some college or lower, 2 = College or above. [c]1 =Hispanic, 2 =Non-Hispanic. [d]1 =Non-white, 2 =White. [e]1 =Not married (e.g., single, divorced, widowed), 2 =Married. [f]1 =Site 1 (a midwestern state), 2 =Site 2 (a northeastern state).
ADL=Activities of daily living. CC=Chronic conditions.
†$p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4
Logistic regression models predicting in-person follow-up with a clinician within 7 days and 30 days of ED discharge (N = 695).

	In-person follow-up within 7 days		In-person follow-up within 30 days	
	Odds ratio	95 % CI	Odds ratio	95 % CI
Block 1: Control variables				
Age	1.00	[0.98, 1.02]	1.01	[0.99, 1.04]
Gender[a]	0.79	[0.57, 1.09]	1.09	[0.71, 1.66]
Education[b]	0.73†	[0.53, 1.02]	1.15	[0.75, 1.76]
Ethnicity[c]	0.95	[0.21, 4.24]	1.27	[0.17, 6.31]
Race[d]	1.09	[0.55, 2.14]	1.00	[0.39, 2.27]
Marital status[e]	1.58 **	[1.13, 2.22]	1.16	[0.75, 1.79]
Study site[f]	1.37†	[0.10, 1.88]	2.40 ***	[1.57, 3.72]
ADL	0.79 **	[0.68, 0.94]	0.75 **	[0.61, 0.91]
Physical health	0.99	[0.97, 1.01]	0.97 *	[0.95, 1.00]
Mental health	0.99	[0.97, 1.01]	1.00	[0.98, 1.03]
CC	1.19 **	[1.07, 1.32]	1.26 **	[1.09, 1.46]
Block 2: Predictors				
Autonomy	1.22	[0.55, 2.75]	1.24	[0.41, 3.30]
Knowledge-based competence	1.19	[0.83, 1.73]	1.28	[0.80, 2.04]
Impaired ability	0.94	[0.62, 1.45]	1.19	[0.68, 2.14]
Relatedness	1.03	[0.70, 1.35]	0.96	[0.69, 1.36]
Happiness	2.10†	[0.94, 5.06]	1.16	[0.42, 4.14]
Calm	0.99	[0.72, 1.38]	1.09	[0.71, 1.67]
Anxiety	1.21	[0.72, 2.06]	1.12	[0.58, 2.34]
Sadness	0.54	[0.23, 1.23]	0.56	[0.22, 1.65]

Note. [a]1 =Female, 2 =Male. [b]1 =Some college or lower, 2 = College or above. [c]1 =Hispanic, 2 =Non-Hispanic. [d]1 =Non-white, 2 =White. [e]1 =Not married (e.g., single, divorced, widowed), 2 =Married. [f]1 =Site 1 (a midwestern state), 2 =Site 2 (a northeastern state).
ADL=Activities of daily living. CC=Chronic conditions.
†$p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

discharge [2,38] for reasons such as limited mobility, impaired cognition, lack of transportation, or technological barriers [35,39,40]. To date, successful work designing the transition coaching program has focused on the content coaches need to *deliver* to patients [13]. In this paper, we treat coaching as a two-way communication process and considered coaches also consciously *receive* information from patients. By transforming the unstructured free text notes into analyzable data, this study suggests that observations reflected in the documented notes may be valuable precursors of the resulting target behavior.

This study extends the current literature on motivation and behavioral change to older populations and brings forth a few theoretical implications. First, our results suggest that need satisfaction plays a critical role in mobilizing older people to act, lending support to SDT [16]. In particular, we provide evidence that fulfillment of knowledge-based competence may facilitate autonomous outreach to health providers online or via phone. The stronger association between knowledge-based competence and 30-day outcomes compared to 7-day outcomes suggests potential effects of competence may take some time to occur.

Emotion, by contrast, is shown as a more transitory factor in association with behavioral activation. Observed negative emotion (i.e., sadness) during a coach visit negatively predicted 7-day follow-up with a medical professional, regardless of communication mode; positive emotion (i.e., happiness) was marginally related to in-person follow-up. These results are consistent with previous findings on the congruence between incidental emotion and resulting behavior [28,29], and provide evidence on how discrete emotions of different valence (positive vs. negative) may distinctively affect the target behavior. Our findings also suggest the pairing of valence and arousal may matter. Specifically, positive emotions paired with high arousal and negative emotions paired with low arousal are each associated with outpatient clinician follow-up. Other pairings received no statistical support. We encourage future research to further examine this question.

We acknowledge that this study has several limitations. The nature of our analysis is correlational thus impossible to determine a causal relationship between these variables. Second, coaches did not receive training in how to capture need satisfaction or emotions. As recording

Table 5
Logistic regression models predicting electronic follow-up with a clinician within 7 days and 30 days of ED discharge (N = 695).

	Electronic follow-up within 7 days		Electronic follow-up within 30 days	
	Odds ratio	95 % CI	Odds ratio	95 % CI
Block 1: Control variables				
Age	1.00	[0.98, 1.02]	1.00	[0.98, 1.03]
Gender[a]	1.06	[0.76, 1.49]	1.11	[0.76, 1.63]
Education[b]	1.10	[0.78, 1.54]	1.13	[0.77, 1.67]
Ethnicity[c]	0.82	[0.16, 3.68]	0.65	[0.09, 3.40]
Race[d]	1.53	[0.77, 3.06]	1.56	[0.72, 3.25]
Marital status[e]	1.05	[0.74, 1.48]	0.93	[0.63, 1.38]
Study site[f]	2.90 ***	[2.08, 4.06]	2.94 ***	[2.00, 4.37]
ADL	0.96	[0.81, 1.13]	1.02	[0.84, 1.25]
Physical health	1.00	[0.98, 1.02]	0.99	[0.97, 1.01]
Mental health	1.00	[0.98, 1.02]	0.99	[0.97, 1.02]
CC	1.19 **	[1.07, 1.33]	1.27 ***	[1.11, 1.45]
Block 2: Predictors				
Autonomy	1.10	[0.47, 2.51]	0.97	[0.35, 2.41]
Knowledge-based competence	1.12	[0.76, 1.63]	1.59 *	[1.04, 2.42]
Impaired ability	0.72	[0.47, 1.12]	0.81	[0.50, 1.34]
Relatedness	1.07	[0.81, 1.40]	1.16	[0.85, 1.60]
Happiness	1.16	[0.51, 2.79]	2.36	[0.79, 10.16]
Calm	1.05	[0.75, 1.48]	1.10	[0.75, 1.63]
Anxiety	0.85	[0.50, 1.46]	0.92	[0.51, 1.74]
Sadness	0.56	[0.24, 1.32]	0.47	[0.19, 1.24]

Note. [a]1 =Female, 2 =Male. [b]1 =Some college or lower, 2 = College or above. [c]1 =Hispanic, 2 =Non-Hispanic. [d]1 =Non-white, 2 =White. [e]1 =Not married (e.g., single, divorced, widowed), 2 =Married. [f]1 =Site 1 (a midwestern state), 2 =Site 2 (a northeastern state).
ADL=Activities of daily living. CC=Chronic conditions.
$^{\dagger}p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

this information was neither required nor standardized, it is possible that the variability in level of in different coaches' notes could confound the results. Third, our coding schemes were mainly dichotomous and therefore may not have been sensitive enough to detect subtle distinctions. We encourage researchers examining similar questions to further refine the concepts used for structural coding, and adopt other content analysis techniques, such as machine learning or natural language processing, as supplementary approaches. Fourth, there were control variables that accounted for significant variance in the outcomes. For example, number of chronic conditions positively predicted outcomes consistently across all regressions. Future studies should examine these factors for their effects on outpatient clinical care. We also acknowledge that our sample lacked diversity in some participant characteristics, and therefore may not represent older adult patients more generally. Last, although beyond the scope of present study, we believe further analyses addressing the effectiveness of CTI could shed light on future implementation.

2.2. Conclusion

To conclude, this study demonstrates the value of CTI coaches' observations in predicting outpatient follow-up, a crucial health behavior for older adult patients post ED-discharge. We highlight the importance of knowledge-based competence and emotions, as they are observed and documented in coach notes, and illustrate the conditions under which they may leverage a target behavior.

2.3. Practice implications

National and local insurers are very interested in covering CTI as these programs have great potential to improve downstream outcomes [41]. The results from this study have several implications for the design of ED-to-home transition interventions. First, intervention programs might encourage coaches to check whether patient have fulfilled their need to express knowledge-based competence and to observe emotions, in addition to delivering the content. For instance, coaches might evaluate how effectively patients can express their capacity for self-management and whether they consider themselves knowledgeable in managing their health. Coaches could also customize strategies for patients with different recommended timeframes of follow-up. For example, identifying negative emotions and providing coping strategies to ameliorate those feelings might be crucial for patients who need to follow up with within a shorter time period (e.g., 7 days). Additionally, if coaches determine patients are deficient in expressing knowledge-based competence, tailored knowledge and skill development coaching might facilitate their outpatient follow-up over a longer time period (e.g., 30 days).

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CRediT authorship contribution statement

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Declaration of competing interest

All authors have no conflicts of interest to disclose.

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