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Athletic Trainers' Observations of Social Determinants of Health in the Secondary School Setting: A Card Study

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Context: Athletic trainers (ATs) are in a unique position to mitigate the negative influences of social determinants of health (SDH) in their patients. In the secondary school setting, understanding common SDH may inform strategies that reduce these influences. However, little is known about the types of SDH that ATs observe in patients in this setting.

Objective: To investigate SDH observed by ATs at the point of care in the secondary school setting.

Design: Descriptive, observational card study.

Setting: Secondary schools.

Patients or Other Participants: Twenty-seven ATs (average age = 29.9 ± 5.6 years, 23 [85.2%] female).

Main Outcome Measure(s): Athletic trainers recorded SDH on a standardized observation card during patient interactions. Cards provided instructions for completion and had a 4-column table with a list of 19 predetermined SDH, a checkbox for observed SDH, a checkbox for perceived negative influence of observed SDH on patient health, and an open box to write in actions taken to address the observed SDH.

Results: Overall, 676 cards with 748 observed SDH were collected from 27 secondary schools. Of those, 46.9% (351/748) were perceived to have a negative influence on patient health. The top 3 observed SDH were academic stressors (14.2%, 106/748), access to social media (12.6%, 94/748), and lack of health literacy (11.4%, 85/748). The ATs reported acting on 37.7% of negatively perceived SDH through counseling and education (48.6%, 137/282), additional resources (20.6%, 58/282), referral to others (17.4%, 49/282), and communication with others (13.5%, 38/282).

Conclusions: Our results indicated ATs in the secondary school setting were observing and acting to mitigate the negative influence of SDH. However, these ATs should be prepared to provide resources for patients negatively influenced by academic stressors, social media, and lack of health literacy. Resources, referrals, and additional education for patients may support a healthier community and positively influence athlete health and well-being.

Key Words: athletic health care, patient outcomes, social factors, academic stressors, health literacy, patient education

Key Points

- Athletic trainers in the secondary school setting observed social determinants of health that were perceived to negatively influence patient health.
- Preparing athletic trainers with resources, referral options, and education may help them support patients experiencing commonly observed social determinants of health, such as academic stressors and behavioral health issues.
- In the secondary school setting, athletic trainers are providing counseling, education, and resources to mitigate the influences of social determinants of health on patients by reducing academic stressors and transportation barriers, as well as improving health literacy.

Researchers have indicated that social factors account for 30% to 55% of patient health outcomes, have positive and negative influences, and are important factors to be addressed by health care providers.[1] Multiple social factors, such as access to quality education and health care, economic stability, social context, and neighborhood and built environments people live in, contribute to health disparities in all populations.[1] These social factors, known as social determinants of health (SDH), are conditions that surround the daily lives of people.[2–4]

Social determinants of health in youth and adolescents influence short-term and long-term health and well-being. For example, education access and quality can have a major influence on health, and a person's level of education can influence specific health outcomes. Further, the completion of secondary school and the pursuit of higher education are associated with childhood survival, lower rates of some chronic diseases, lower injury rates, and higher levels of empowerment.[5,6] Another SDH that strongly influences adolescent health and well-being involves social support from family, peers, and caring adults. Social support has been identified as the primary influence on childhood development and is a protective factor in adolescence against poor health outcomes.[5] For those who experience adversity in childhood, support from a trusted adult can ease immediate harm and help them build resilience.[5] Neighborhood and built environments are also very influential to adolescent health and well-being. Viner et al suggested, when neighborhood deprivation is present, youth are at an increased risk of violence, teen pregnancy, and poor mental health and

educational attainment.[5] Lastly, economic stability encompasses occupation, employment status, and income, all of which have the potential to influence health insurance coverage, ability to access healthy foods, affordable housing, and transportation. More specifically, timing of care can be influenced and often prolonged among patients who are socioeconomically disadvantaged. When using private health insurance, for example, adolescents with acute knee injuries were found to be 57 times more likely to obtain the necessary health care appointment than those with public health insurance.[7] These SDH are critical to address among athletic trainers (ATs) due to their influence on acute and long-term health care.

Despite the many benefits of physical activity, including sport participation, secondary school athletes are still influenced by SDH.[8–14] For youth and adolescent athletes participating in sport at the secondary school level, care for sport-related injury is often provided by an athletic trainer (AT). In this setting, ATs provide daily care to patients through a care model that is unique in health care. They often have numerous opportunities before, during, and after practices for meaningful patient interactions through evaluations, rehabilitation, patient education, and preventative interventions. This daily patient interaction provides increased opportunities to observe and learn about factors influencing patient health that may be unobserved in more traditional models of care. It is worth highlighting that a full-time AT in the secondary school adds value to the health of athletes, by increasing access to a licensed health care provider. However, not all schools employ ATs or employ them in a full-time model of care, and schools associated with lower socioeconomic status or who include more students on free and reduced lunch may have reduced access to athletic health care services.[15–17]

Given their singular position within the health care system, ATs in secondary schools may be able to address SDH due to their unique roles as the first line of health care in many communities. Athletic trainers already address several SDH by providing prevention recommendations, nutrition education, and counseling services to student athletes.[18,19] They also incorporate their patients' SDH and socioeconomic status when developing a plan of care. For example, Hernandez et al found that most secondary school ATs strongly agree that patients' socioeconomic status influences health insurance, their ability to refer, and dependence on conservative care before referral.[20] Additionally, they are often the primary and most regularly available health care provider for student athletes. Therefore, knowledge of SDH experienced by patients, especially secondary school athletes, can lead to direct support in areas that may have a greater influence on their health. When ATs recognize SDH in their patients or athlete population, they are better able to support their patients, provide guidance about appropriate resources, and facilitate referral.[21] Currently, data are limited about how SDH influence clinical management in the secondary school setting. Therefore, the purpose of the current study was to investigate SDH observed by ATs at the point of care in the secondary school setting. Specifically, we wanted to identify which SDH were observed in the secondary school setting, the perception of each SDH relative to patient health, and how ATs addressed SDH that negatively influenced patient care.

METHODS

Study Design

The current study was part of a larger project investigating ATs' observations of SDH in patients from different clinical practice settings.[22] Our descriptive study design involved a prevalence observational card study guided by the naturalistic inquiry research tradition. We used the card study design because it is a field-tested method used to collect patient-level observations by health care providers at the point of care.[23,24] The naturalistic inquiry approach complements the card study design because this approach does not attempt to alter or manipulate the phenomenon of interest.[25] The goal of this research design is to gain insight into the natural environment, while also generating new questions to guide a deeper understanding of the phenomenon.[26] The current study was reviewed and determined exempt by A.T. Still University's Institutional Review Board.

Participants

Using criterion-based convenience sampling, ATs employed in the secondary school setting were recruited to participate through direct contact by email from the principal investigator or through social media (ie, Twitter and Facebook) posts. Using social media to broadly recruit ATs was done to encourage participation from across the country. Individuals were considered eligible to participate if they were certified by the athletic training Board of Certification and currently providing athletic training services in a secondary school setting. Thirty-nine eligible ATs inquired about participation.

Instrumentation

Study packets were sent to all ATs and included data collection instructions, thirty 9- × 6-inch SDH cards, and a definition sheet for all SDH listed on the cards. Each card had a table with columns that included a list of 19 SDH, a checkbox for SDH observed, a checkbox for perceived negative influences of that SDH on patient health, and an open box to write in actions taken to address the observed SDH.[22] All SDH included on the cards fit into 1 of the 5 domains as previously presented.[22] Athletic trainers were instructed to record observed SDH on the standardized observation card during patient interactions. A prepaid, preaddressed envelope to return all materials to study investigators was also included. The cards used in the current study were also used in the collegiate or university setting and were designed to be completed in less than 30 seconds.[22] The SDH card was used to capture observed SDH during meaningful patient encounters.[22]

Procedures

The principal investigator contacted ATs from around the country in various regions and school districts to set up the best time frame for each AT to complete their data collection. A week before data collection, ATs were emailed a link to complete an online training in Qualtrics. The training provided information about study procedures and expectations including study purpose, how and when to fill out the observation cards, as well as an educational overview

of SDH and their importance in health care. This training took approximately 20 to 30 minutes to complete. After the training and before data collection, the principal investigator contacted all ATs to answer any additional questions about the study procedures.

Each participant collected data during an assigned 2-week period. Athletic trainers were provided 30 cards to complete in reference to meaningful patient encounters during that period. If an AT completed 30 cards before the 2-week period ended, their data collection was over. No requirement was given for a participant to complete all 30 cards because it was anticipated that some ATs would not have 30 encounters that met the inclusion criteria over that period. Athletic trainers were instructed to record SDH observations on the cards after meaningful patient encounters. Meaningful patient encounters have been previously operationally defined as "an interaction that occurs through verbal communication and/or physical examination,"[27] and an example is a patient engaged in passive stretching before or after practice, when a conversation related to the stretching, health, or other aspects of life between the AT and patient occured.[22] Patient encounters that did not meet the definition of a meaningful encounter were not to be recorded on a card. Only 1 card was to be filled out per patient, and no demographic or injury-related data were collected from patients. To ensure data were being collected during all months of the academic year, we scheduled only 2 to 3 ATs to collect SDH observations at one time. Athletic trainers returned their completed cards in the envelope provided to the principal investigator at the end of data collection. Data collection occurred from August 2021 through May 2022. After completion of the study, ATs were sent a stipend for their participation.

Data Analysis

The approach to data analysis followed that of the previous card study.[22] Data from completed SDH cards were entered into Microsoft Excel (Microsoft Corp) by the principal investigator. Descriptive statistics were analyzed for quantitative data, including demographic characteristics of participating ATs, frequency of cards completed, frequency of SDH observed, and frequency of SDH that ATs perceived as having a negative influence on a patient. Deductive thematic analysis was used to qualitatively characterize the reported actions taken by ATs.[25] The 9 SDH, education, income and wealth, employment, health systems and services, housing, physical environment, transportation, social environment, and public safety, delineated by the National Academies of Sciences, Engineering, and Medicine, were used as predetermined themes during this analysis.[28] The open-ended text responses describing actions taken by ATs to mitigate negatively perceived SDH were analyzed through multiple phases by a 3-person data analysis team. To evaluate the actions taken, these phases were guided by a modified consensual qualitative research approach, and the details of this approach have been published elsewhere.[22,29,30] Essentially, the 3-person data analysis team coded 50 rows independently to create a codebook and then worked to reach a consensus codebook on the open-ended text responses so that clear categories were developed. The next step was for data analysis team members to review and code all responses until consensus was reached.

Table 1. Secondary School Athletic Trainer Demographic Characteristics (N = 27)

Characteristic	No (%)
Sex	
Male	4 (14.8)
Female	23 (85.2)
Race	
White	25 (92.6)
American Indian or Alaska Native	1 (3.7)
Asian	1 (3.7)
Highest degree attained	
Bachelor's	5 (18.5)
Master's	20 (74.1)
Clinical doctorate	2 (7.4)
Years as a certified athletic trainer	
0–4	11 (40.7)
5–10	11 (40.7)
11–15	2 (7.4)
16–20	2 (7.4)
21–25	1 (3.7)

RESULTS

Of 39 ATs who inquired about participation, 27 (mean ± SD age = 29.9 ± 5.6 years, 23 [85.2%] female) were selected to participate from 27 different secondary schools and collectively completed 676 observation cards (Table 1). Athletic trainers marked "no SDH was observed" in 33.4% (226/676) of patient encounters and that they were "unsure whether a SDH was present" in 9.6% (65/676). Across all cards, 748 SDH were observed. Of the 748 observed SDH, the 3 most common were academic stressors (14.2%, 106/748), access to social media (12.6%, 94/748), and lack of health literacy (11.4%, 85/748).

Across the cards and the 748 observed SDH, 46.9% (351) of them were perceived by ATs to have a negative influence on patient health (Table 2). Of those 351 observations, the most frequently reported SDH to be perceived as negatively influencing patient health were lack of health literacy (16.5%, 58/351), academic stressors (9.4%, 33/351), individual or family life circumstances (9.1%, 32/351), and behavioral health issues (9.1%, 32/351; Table 2). The SDH that were reported less frequently but were highly perceived to have a negative influence on health were homelessness or poor or unstable living conditions (100.0%, 5/5), insufficient or lack of health insurance (87.5%, 28/32), and food insecurity (81.0%, 17/21).

Of the 748 observed SDH, ATs reported acting on 37.7% (282; Table 2). The themes that emerged from analysis included such actions as counseling and education (48.6%, 137/282), providing additional resources (20.6%, 58/282), referral to others (17.4%, 49/282), and communication with others (13.5%, 38/282).

DISCUSSION

In the current study, we investigated SDH observed by ATs at the point of care in the secondary school setting. Results from the current study suggested that ATs were observing a variety of SDH in this patient population. In many instances, ATs had taken steps to mitigate the negative influence of SDH in their patients. Although SDH related to social media and lack of health literacy were

Table 2. Athletic Trainers' Observations of Social Determinants of Health and Actions Taken When Social Determinants of Health Were Perceived to Have a Negative Influence on Health[a]

	Observations		Action Taken				
Social Determinant of Health	Observed in a Patient	Perceived as Negatively Influencing Patient Health	Counseling and Education	Provide Additional Resources	Referral to Others	Communication With Others	Total
Academic stressors (2)	106	33	17	5	4	2	28
Access to social media or emerging technologies (5)	94	13	7	1	2	0	10
Lack of health literacy (3)	85	58	55	1	1	0	57
Individual or family life circumstances (5)	64	32	9	2	4	4	19
Language barrier (2)	50	23	3	1	3	20	27
Poor social support (5)	48	30	12	4	2	3	21
Behavioral health issues (5)	47	32	7	0	14	3	24
Job stressors (1)	42	12	6	3	0	1	10
Transportation issues (4)	36	19	2	14	2	2	20
Insufficient or lack of health insurance (3)	32	28	3	6	12	1	22
Family care demands (5)	28	12	2	3	1	0	6
Food insecurity (4)	21	17	4	12	1	1	18
Cultural beliefs or values (5)	17	5	3	0	0	1	4
Poverty or near poverty (1)	13	7	0	1	0	0	1
Educational limitations (2)	13	6	0	2	0	0	2
Substance use or abuse (5)	12	8	4	0	2	0	6
Other	12	5	3	0	0	0	3
Migrant or immigration status (5)	7	3	0	0	0	0	0
Neighborhood safety (4)	6	3	0	1	0	0	1
Homeless or poor or unstable living conditions (4)	5	5	0	2	1	0	3
Total	748	351	137	58	49	38	282

[a] Data are reported as frequency. Domain: (1) = economic stability; (2) = education access and quality; (3) = health care access and quality; (4) = neighborhood and build environment; and (5) = social and community context. Other social determinants of health included athletic stressors (n = 3), coach stressors (n = 1), interpersonal stressors (n = 1), mental health and financial stressors (n = 1), playing multiple sports at one time (n = 1), pressure to compete at best (n = 1), sports stressors (n = 3), and worn-out equipment and shoes (n = 1).

frequently observed in patients, they were not always perceived as having a negative influence. However, a few SDH—homelessness, lack of insurance, and food insecurity—were frequently perceived as negatively influencing the overall health of patients. Collectively, these data confirm that SDH are influencing the lives of secondary school athletes, and a deeper investigation of these results may identify opportunities for ATs to assess and address SDH which have the potential to negatively influence health.

Collectively, what we demonstrate in this study is that ATs are observing SDH during interactions with their patients and, in many cases, working to reduce the negative influence in support of promoting the patients' health. Our findings continue to support the notion that ATs are valuable in the secondary setting to address SDH and, ultimately, decrease health disparities. It is important to recognize that many of the schools without an AT are those with students from lower socioeconomic status and those on free and reduced cost lunches.[16,17] This lack of AT presence could continue to increase disparities in health and well-being in this population.

Of the SDH reported by ATs in our study, academic stressors were the most frequently observed SDH and one of the most negatively influencing patient health. Although adolescents gain positive benefits from educational attainment, the stress of academics can have a negative influence on their health and well-being.[31] For example, in a systematic review, during the last 2 years of secondary school, 1 in 6 students were in extreme distress.[31] Academic stress may result in substance abuse, sleep disorders, and decreased physical health.[32] In the short term, it can cause decreased motivation and academic achievement that may reduce sustainable employment in the future.[32] For adolescents experiencing negative health influences from academic stressors, ATs are well positioned to provide referral to school advisors or counselors or a safe place for students to complete homework. Another example in which ATs play an important role reducing academic stress is postconcussion during the return to learn process. The most recent bridge statement on concussion management states that ATs should be involved in policy development and educating team members on the influence of concussion on learning, to improve patient transition back to the classroom.[33] Whether directly or indirectly, ATs have the ability to mitigate academic stressors for patients in the secondary school setting.

The use of social media was commonly observed in the current study, although ATs did not indicate that they perceived social media use to have a negative influence on the health of their patients. Even though findings from the current study did not overtly suggest a negative influence of social media, given the frequency of observation, ATs should be aware of the potential influences of social media

on the populations they serve and be prepared to support their patients. Importantly, it is reported that nearly all adolescents aged 13 to 17 years use social media.[34] For all users, social media have both positive and negative influences on health and well-being. In the adolescent population, the benefits of social media use include connections with like-minded individuals, a space for creative expression, and online social support.[34] However, increased use of social media can lead to increases in mental health conditions, such as anxiety and depression, body image distortion, and cyberbullying incidents.[34] Because ATs are likely to observe social media use, being aware of and anticipating negative health influences, such as psychosocial considerations, could increase recognition and hasten health care resolution.

Behavioral health issues in adolescents can arise from a variety of sources and causes, such as adverse childhood events, socioeconomic status, or the environment in which they are raised.[5] Identification of the causes of behavioral issues in this population is outside the scope of the current study; however, understanding the intersection of behavioral and mental health with other SDH is crucial.[5,35] Our results highlight the importance of behavioral and mental health awareness in athletic health care. Having the ability to recognize the signs and symptoms of behavioral and mental health conditions should be a high priority for all individuals interacting with adolescents. Additionally, as emergency action plans are needed for any general medical condition, mental health policies and procedures are needed to support the health of people experiencing a behavioral or mental health crisis.[36] Suggestions for creating emergency action plans for behavioral and mental health crises in the high school athletic population are available and may be a starting place for creating such plans and ensuring that school staff are prepared for a mental health emergency.[36,37] During adolescence, good health behaviors can be established and carried over into adulthood, and the influence of ATs regarding creation of healthy behaviors should be considered when treating this population.

Another SDH in the current study that was perceived as negatively influencing health in patients was individual or family life circumstances. In this population, the most persuasive influence on development and health outcomes is the patient's family.[38,39] Further, researchers have suggested that family involvement decreases problematic health behaviors.[5] Data from our study also suggested that individual or family life circumstances could be detrimental to the patient's health as perceived by the ATs, although the exact rationale or reason for this perception is unknown. Engagement with parents or guardians is crucial for the care of patients in the secondary school setting, and our findings indicated an important connection with life circumstances or family ties that may warrant further study. Perhaps ATs in this setting, and possibly school counselors, may benefit from additional training and education to better screen for, identify, and navigate situations in which family life circumstances influencing health.[40] Because ATs in the secondary school should be communicating with guardians about the injuries and care needs of their children, it is important that ATs are equipped to navigate positive family situations and prepared for circumstances that require more delicate handling.

Of all the SDH evaluated in our study, one of the most observed and acted on was lack of health literacy. Across multiple health care settings, findings from a systematic review suggested that individuals lacking health literacy have worse outcomes, poor ability to understand their condition and treatment plan, decreased likelihood of following medical advice, and less use of the health care system.[41] Additionally, reduced health literacy in adolescent patients has been associated with a variety of factors, such as lack of health care experience, race, and parental income.[42] However, evidence-based education strategies, such as those focusing on physical activity, diet, and mental health, can be used with adolescents at a young age to help them better understand their health and the health care system, which can reduce health disparities later in life.[43] Oftentimes, ATs fill gaps in health literacy by educating their patients on the health system, such as through guiding patients to the appropriate health care provider and helping them navigate the entire health care system. Another way to improve health literacy is to ensure patients are accessing health information through credible sources, especially since this age group spends a lot of time on their devices and social media. Gray et al reported adolescent students have difficulty accessing health information, an inability to accurately describe symptoms, and trouble applying their search engine findings.[44] Therefore, ATs in this setting should consider participating in training programs that teach them how to identify and educate those with low health literacy.[45] Other sources should also be considered. For example, the Centers for Disease Control and Prevention offer curricula for various age groups, including those in the secondary school setting (https://www.cdc.gov/healthliteracy/education-support/schools.html#:~:text=Developing%20personal%20health%20literacy%E2%80%94the,%2C%20adolescents%2C%20and%20young%20adults). Because ATs have the background and knowledge to educate patients on health-related information, they are ideal advocates for their patients and can assist them with navigation of the health care system, reducing the negative influence of lack of health literacy.

An interesting result of the current study involved a few SDH that were infrequently observed yet had a highly negative influence on the health of the patient. The specific SDH related to this finding were homelessness or poor or unstable living conditions, insufficient or lack of health insurance, and food insecurity, all of which may be difficult to observe at the point of care. Athletic trainers in this setting should consider the communities in which their schools are located and the barriers related to SDH that their patients may face.[46] Greater awareness of school location and the surrounding community may be helpful when proactively identifying the best resources to support the patient population in the community. Homelessness, lack of insurance, and food insecurity are issues that an AT may have limited capacity to address, but knowledge of existing community resources is a first step in being prepared when one of these SDH emerge. For example, the US Department of Health and Human Services (HHS) provides resources (https://www.hhs.gov/programs/social-services/homelessness/resources/index.html) for people who are experiencing homelessness, and these resources may also help ATs be prepared for a situation in which being

homeless is a reality for a patient. Similarly, ATs are unlikely to alter a patient's insurance status, but they may be able to support or guide patients to more affordable health care options. Awareness of the types of low-cost services that are available in the local community would help ATs prepare to support patients with limited or no health insurance. Additionally, many low-income renters have reported experiencing homelessness, having to move multiple times, or being behind on rent, all of which increases the odds of adverse childhood health and maternal hardship.[47] Therefore, although ATs may be unable to physically move patients from their living situations, they can educate patients and their parents about available community resources, such as shelters or government aid. In addition to the previously mentioned resources available through the HHS, the US Department of Housing and Urban Development is another starting point to guide retrieval of these resources (https://www.hudexchange.info/housing-and-homeless-assistance/). Finally, food insecurity was not observed often by ATs in our study, but it is highly associated with other SDH that greatly influence health in this population. Adolescents with food insecurity have been reported to experience anxiety, mood disorders, depression, and substance abuse at higher rates than those without food insecurity.[48] Strategies to address food insecurity in patients may include offering free snacks or finding other mechanisms of support, such as education on food pantries or school programs that provide food to students and families in need. Clearly, future investigations of existing strategies used by ATs to support patients who experience negative SDH are necessary.

Limitations

The current study had limitations consistent with those reported in previous card studies.[22,24] Although, in this study, we used an observational design, the observations were from the perspective of the AT and did not include patient observations or confirmation of the AT's observations. Therefore, it is possible that a SDH the AT perceived as having a negative influence on patient health may not have been perceived that way by the patient, as the patient perspective was not collected. Future researchers should consider SDH from the perspective of the patient. Additionally, since high school students are often under the care of parents or legal guardians, the observed SDH in our study may have been influenced by circumstances outside patients' control. Thus, ATs in the secondary school setting should be cautious when observing SDH in high school students and be considerate of external factors that may influence a patient's health and well-being. Lastly, although ATs in this study reported acting when a SDH was negatively influencing their patients' health, the success of these actions is unknown, and future researchers should explore the effectiveness of common actions taken.

Athletic trainers in the secondary school setting have the unique opportunity to serve their community and mitigate the negative influence of SDH on their patients. To our knowledge, we are some of the first to document the ability of ATs to observe and mitigate SDH in the secondary school setting. Given that SDH are being observed in these patients, secondary school ATs may benefit from being prepared with resources to support patients who are influenced by SDH, such as lack of health literacy, academic stressors, behavioral health issues, or individual or family life circumstances. Additionally, because of the likelihood that homelessness or poor or unstable living conditions, insufficient or lack of health insurance, and food insecurity negatively influence patients, ATs should be prepared with a few key resources to support patients experiencing these SDH. Although, in the current study, we focused on AT observations, standard practice in medicine involves screening for SDH, and this practice should also be considered as standard for athletic health care. Athletic trainers need to be knowledgeable not only about the resources available at their place of work but also about existing community resources that can mitigate the negative influence of SDH and promote positive patient health outcomes.

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