

Lost Touch? Implications of Physical Touch for Physical Health

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Abstract

Objectives: Growing research on the impact of physical touch on health has revealed links to lower blood pressure, higher oxytocin levels, and better sleep, but links to inflammation have not been fully explored. Physical touch may also buffer stress, underscoring its importance during the stressful time of living in the COVID-19 global pandemic – a time that has substantially limited social interactions and during which physical touch has been specifically advised against. **Methods:** We analyze nationally representative longitudinal data on older adults (N=1124) from the National Social Life, Health, and Aging Project using cross-lagged path models. **Results:** More frequent physical touch is significantly related to a lower likelihood of subsequent elevated inflammation. **Discussion:** These findings highlight the importance of finding safe ways to incorporate physical touch, even in the aftermath of the COVID-19 pandemic.

Keywords: Inflammation, COVID-19, touch

Accepted Manuscript

In the wake of the COVID-19 pandemic, we saw “stay at home” orders across the United States. These orders largely confined individuals to their own households, cutting off in-person contact with many friends, family members, and neighbors to limit the spread of COVID-19. There is a well-established literature linking engagement in social relationships to better health and well-being (e.g., House et al., 1988; James et al., 2011), but those confined to their homes during the COVID-19 pandemic have had their outlets for social engagement substantially limited. Moreover, the Centers for Disease Control and Prevention have suggested that older adults are at higher risk for severe illness from COVID-19, which may prompt them to be particularly wary of social interactions. The pandemic highlights the double-edged sword of social relationships during this time: that social relationships are often protective for health (Umberson & Montez, 2010), but they increase the risk of COVID-19 disease transmission, with potentially fatal effects, particularly among older adults. Especially pertinent to the COVID-19 pandemic and precautions of maintaining at least six feet of distance between people outside one’s household, is the impact of interpersonal touch for health, and what it means when opportunities for physical touch are more limited.

Physical touch may include hugging, being held, greeting with a pat on the back, or other close physical contact, and it has been linked to multiple physiological effects such as lower blood pressure, lower heart rate, and higher oxytocin levels (Field, 2010). Many of these physiological effects have been related to lower levels of inflammation (Jankowski et al., 2010), suggesting that physical touch may be anti-inflammatory as well. Chronic inflammation has been linked to a higher likelihood of heart attack, stroke, mortality, as well as higher levels of viral infection (Crimmins & Vasunilashorn, 2011). In studying another virus, Cohen and colleagues (2015) conducted daily telephone interviews for 14 days

assessing support and strain in social relationships prior to exposing participants to a virus causing the common cold. They found that more frequent hugging in those two weeks before virus exposure was related to lower risk of infection, less severe illness, and a buffering effect on the higher risk of infection among those experiencing more tension or conflict in their relationships.

Theory and evidence suggest that physical touch may buffer stress, which underscores its importance during the stressful time of living in a global pandemic that specifically limits physical touch. The stress model suggests that social support is a resource that could mediate the impact of stress (Pearlin et al., 1981), and physical touch is a potential source of social support garnering growing attention. Jakubiak and Feeney (2019) found that receiving more physical touch from a spouse while discussing a stressor was related to lower stress levels, higher self-esteem, and greater perceptions of being able to overcome the stressor. Greater affectionate support, which included hugging, helped reduce the adverse impact of the stress of ethnic discrimination on depressive symptoms (Garcini et al., 2019). Moreover, a combination of high physical touch and high emotional/instrumental support can be protective against high blood pressure (Lee & Cichy, 2020). In addition, physical touch even from people who are not close family or friends may be beneficial, as evidenced by the positive impact of physical touch from nurses on patients' improved sleep, blood pressure, respiratory rate, and pain (Papathanassoglou & Mpouzika, 2012). Even the brief touch on a shoulder by an experimenter was related to less anxiety about death (Koole et al., 2014). Collectively, much of this research has focused on the effects of physical touch on health in the short-term, but less is known about the long-term effects of physical touch on health, even though long-term inflammation has important implications for age-related disease and impairment (Jenny et al., 2012).

In this brief, we analyze nationally representative longitudinal data on older adults to examine the long-term impact of physical touch on subsequent physical health in terms of chronic inflammation five years later, with each of these measures assessed at both waves. We then discuss the implications of our findings for the COVID-19 pandemic and its aftermath.

Methods

Sample

We used data from two waves of the National Social Life, Health, and Aging Project (NSHAP), a nationally representative, population-based sampling of older adults in the United States. Our analysis focused on older adults (age 60+) who provided blood spot samples of C-reactive protein (CRP) at both waves. As standard in the literature, cases with high levels of CRP (>8.6 mg/L) indicative of inflammatory response to acute conditions were dropped from the analysis (Herd et al., 2012). The final analytic sample size is 1,124.

Key Measures

A blood sample for CRP was collected via a finger stick and disposable lancet and applied to filter paper. The assays were conducted at the laboratory for Human Biology Research at Northwestern University (Williams & McDade, 2009). Higher CRP levels indicate a more chronic inflammatory state. We used clinical cutoffs for high (>3 mg/L) and medium/low (≤ 3 mg/L) inflammation. Supplementary analyses using ordinal and interval-ratio versions of CRP yielded the same pattern of results.

Physical touch was measured by assessing the frequency of tactile interaction (e.g., hug, kiss, pat on the back) with a romantic partner and other adults (family members,

neighbors, and friends) in the past 12 months. Responses ranged from never (0) to several times a week (6). The items were averaged by the number of valid answers to create an overall measure for touch, where higher numbers indicate greater amounts of physical touch.

Analytic Plan

Cross-lagged path models were used to estimate CRP at Wave 2 while taking into account the possibility of reverse causality of CRP influencing Touch at Wave 2 (Finkel, 1995). In each model, we included Wave 1 CRP and physical touch measures along with a set of control variables at baseline, including sociodemographic information and health lifestyle factors. We also employed Heckman's (1979) models to adjust for selection bias due to mortality. Descriptive analyses were conducted in Stata 15 and the substantive analyses in Mplus 8.

Results

Table 1 presents the descriptive statistics for the study variables. The average level of physical touch was 3.76 (about once a month) at Wave 1 (W1) and 2.11 (about once or twice a year) at W2. In terms of inflammation, 20% and 28% of the respondents exhibited high levels of CRP ($>3\text{mg/L}$) at W1 and W2, respectively.

Table 2 presents the results from the cross-lagged model predicting CRP and physical touch at W2, and Figure 1 graphically represents the significant relationships from this analysis. Log-odds are reported for CRP, and unstandardized regression coefficients are presented for physical touch. The findings show that, net of covariates, more frequent physical touch at W1 is significantly associated with a lower likelihood of chronic inflammation at W2 ($b = -0.15, p=0.009$). In terms of the odds ratio, frequent physical touch is associated with a 14% lower probability of elevated chronic inflammation, adjusting for

covariates, lagged dependent variables, and non-random selection effects. Supplementary analysis (not shown) including both W1 and W2 physical touch predicting CRP at W2 shows a significant relationship between W1 physical touch but not W2 physical touch, suggesting the importance of the long-term impact of physical touch on chronic inflammation. It is noteworthy that inflammation at W1 is not significantly associated with physical touch at W2 ($b = -0.06$, $p=0.56$), mitigating a concern for reverse causality.

Discussion

The COVID-19 health crisis has revealed a paradox in the implications of social relationships for health. On the one hand, social relationships are often beneficial for a plethora of health outcomes (House et al., 1988; Umberson & Montez, 2010); on the other, social relationships can be dangerous in the spread of COVID-19, with devastating effects for some individuals. “Social distancing” has become a popular term during the COVID-19 pandemic and has been at the forefront of policies to reduce the spread of the disease. Although it refers to keeping physical distance from others, it affects social relationships as well. Both informal and formal social activities increase the likelihood of sharing friendly touch (Upenieks & Schafer, n.d.). Supplemental analyses suggest the social activity of volunteering is related to lower odds of inflammation; it is possible that social activities also indirectly influence inflammation through creating opportunities for more frequent friendly touch. However, many of these social activities have been substantially limited or eliminated during the pandemic, and maintaining physical distance precludes opportunities for physical touch. Moreover, older adults have been deemed to be at higher risk for severe illness from COVID-19 by the CDC, which may lead them to be particularly wary of engaging in physical touch with others. In this brief, we used nationally representative longitudinal data on older

adults to examine the influence of physical touch on physical health in the form of chronic inflammation.

Our findings indicate that more frequent physical touch (e.g., hugging, kissing, a pat on the back) by a romantic partner, family, friends, and neighbors was related to a lower likelihood of elevated chronic inflammation after five years, suggesting the long-term impact of physical touch for health. This relationship held even after adjusting for covariates, lagged dependent variables, and selection effects. This is in line with a growing literature on the positive impact of physical touch for health and well-being (e.g., Cohen et al., 2015; Field, 2014; Garcini et al., 2019; Lee & Cichy, 2020). Research on physical touch has also shown that it is related to lower stress and greater feelings of being able to overcome stress (Jakubiak & Feeney, 2019), which is relevant in the context of the stressful time of living in a global health crisis.

Future research on this topic is ripe for exploration. For example, future research could add nuance to these findings by subdividing physical touch from a romantic partner versus with other adults, as well as examine whether age plays a role such that touch is more impactful for older or younger groups. Future work could also examine whether underlying health conditions moderate this relationship, as individuals with these health conditions may be the most touch-deprived as family and friends avoid interaction that could increase risk of COVID-19 transmission for vulnerable members of their network.

There are several implications of our finding that more frequent touch is related to lower risk for chronic inflammation. Around 71% of older adults live with family or nonfamily members in a household (Roberts et al., 2018). If these household members are not in high-risk situations related to COVID-19, perhaps encouraging positive physical touch among household members may be protective for older adults' health, stress levels, and well-being. Importantly, about 26% of adults age 65 and older—close to 13 million Americans—

live alone (Roberts et al., 2018). Past research has demonstrated that social isolation is harmful to health and well-being (Nicholson, 2012), and the threat of physical and social isolation may be heightened in the midst of the ramifications of the COVID-19 pandemic shuttering many outlets for older adults' social engagement. Self-applied touch to one's palm of the hand has been linked to positive signals in the brain (Field, 2014), which may be helpful for older adults living alone who do not have access to physical touch from others. However, a lack of physical touch may coincide with a lack of social interactions, lack of social support, and lack of companionship. It may be particularly important to reach out to this group in safe ways that can help reduce stress and promote health.

A recent study conducting simulations of different types of social networks and interactions during the COVID-19 pandemic suggests that repeated interactions in a closed network of low-risk individuals may help individuals increase their social interactions while not substantially increasing their COVID-19 risk (Block et al., 2020). Perhaps strategic, repeated contact with one or two low-risk individuals who similarly interact with only each other can help older adults deprived of touch and social interaction to reap these benefits without substantially increasing their risk for COVID-19. The aftermath of the COVID-19 pandemic may create a "new normal" in which people are hesitant to greet acquaintances with physical touch, such as handshakes, which may reduce everyday sources of touch. Thus, physical touch such as hugging with fewer, closer ties may be especially important in this new normal.

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Table 1. Descriptive Statistics of Study Variables (N=1,124)

	Range	Mean (SD) or Proportion
Touch W1	0-6	3.76 (1.57)
Touch W2	0-6	2.11 (1.42)
High CRP W1	0, 1	.20
High CRP W2	0, 1	.28
Age	62-85	73.6 (7.49)
Female	0, 1	.51
Race		
White (Ref.)	0, 1	.81
Black	0, 1	.12
Other	0, 1	.07
Partnered	0, 1	.65
Education		
Less than Bachelors (Ref.)	0, 1	.75
Bachelors or More	0, 1	.25
Current Smoker	0, 1	.14
Obesity	0, 1	.37
Physical Activity	0-4	3.35 (1.17)
Self-Rated Physical Health	0-4	2.27 (1.03)
CES-D	0-27	4.99 (4.82)

Note: Standard deviations in parentheses next to means.

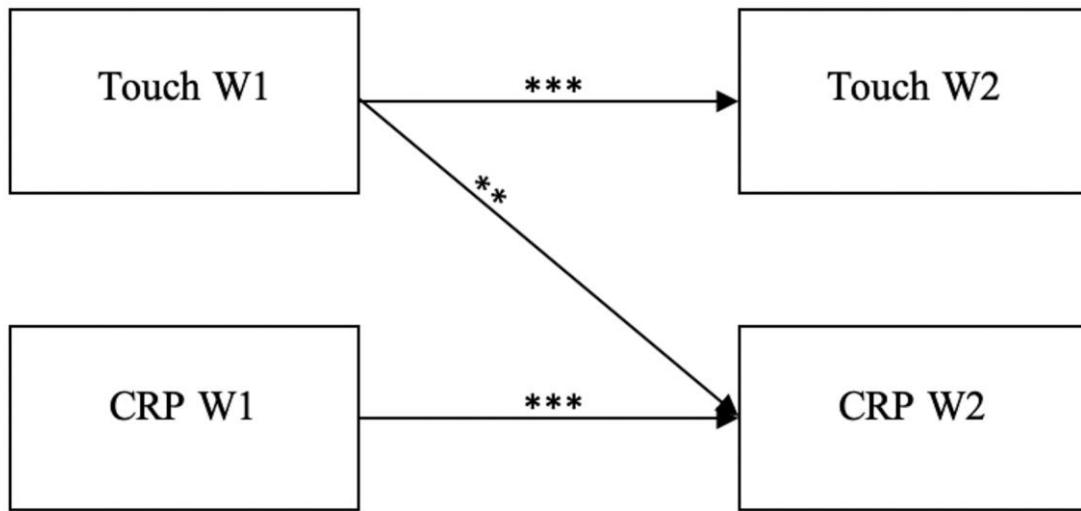
Table 2. Cross-Lagged Model Predicting Physical Touch and CRP (N=1,124)

Predictors	W2 CRP		W2 Touch	
	Log-odds	95% CI	B	95% CI
Touch W1	-0.15**	-0.26, -0.04	0.24***	0.18, 0.30
CRP W1	1.56***	1.24, 1.89	-0.06	-0.24, 0.13
Age	0.02	-0.004, 0.04	-0.03***	-0.04, -0.02
Female	0.20	-0.11, 0.51	0.19*	0.03, 0.34
Race				
Black	0.25	-0.20, 0.70	-0.53***	-0.79, -0.28
Other Race	0.00	-0.61, 0.61	-0.02	-0.39, 0.34
Partnered	0.13	-0.25, 0.50	0.38***	0.21, 0.56
College Graduate	0.10	-0.23, 0.43	0.03	-0.16, 0.21
Obesity	0.67***	0.35, 0.99	0.02	-0.14, 0.18
Current Smoker	0.16	-0.31, 0.62	-0.07	-0.31, 0.16
Physical Activity	0.05	-0.08, 0.18	0.003	-0.06, 0.07
Self-Rated Health	-0.01	-0.15, 0.14	0.05	-0.03, 0.13
CESD	0.003	-0.03, 0.04	-0.02*	-0.04, -0.001

Note: Both Wave 2 CRP and Wave 2 Touch were estimated simultaneously in one model.

Coefficients are unstandardized.

Figure1



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