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# Promotion of Social Competence with the Sports-Therapeutic Volleyball Program GDivP in Forensic Psychiatry: a Pilot Study

*Förderung der sozialen Kompetenz durch das sporttherapeutische Volleyballprogramm GDivP in der forensischen Psychiatrie: eine Pilotstudie*

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## Summary

► In German forensic psychiatry, sports therapy denotes an accompanying therapeutic treatment, although evidence about specific psychometric and mental health outcomes is lacking. This article provides an important contribution to sports therapy interventions. It focuses on one of the most important sports therapy goals for forensic patients: social competence. For this purpose, the intervention 'Group Dynamics in Volleyball Program' (GDiVP) was developed, which included practice of three components of social competence: perspective adoption, communication skills, and social responsibility. This study included a pre-post control group design. According to the results, GDiVP improved all three of the components of social competence mentioned above. Further studies must determine how sustainable the positive changes are and to what extent the intervention can be transferred to other sports.

## Zusammenfassung

► Innerhalb der deutschen forensischen Psychiatrie stellt die Sporttherapie eine begleitende therapeutische Behandlung dar, obwohl es an Evidenz über spezifische psychometrische und psychische Gesundheitsoutcomes mangelt. Dieser Artikel liefert einen wichtigen Beitrag zu evidenzbasierten sporttherapeutischen Interventionen. Er legt den Fokus auf eines der wichtigsten sporttherapeutischen Ziele für forensische Patienten: Soziale Kompetenz. Hierfür wurde die Intervention 'Gruppendynamik im Volleyball-Programm' (GDiVP) entwickelt, in der drei Komponenten der sozialen Kompetenz geübt wurden: Perspektivenübernahme, Kommunikationsfähigkeit und soziale Verantwortung. Diese Studie beinhaltete ein Prä-Post-Kontrollgruppen-Design. Den Ergebnissen zufolge verbesserte GDiVP alle drei oben genannten Komponenten der sozialen Kompetenz. Weitere Studien müssen zeigen, wie nachhaltig die positiven Veränderungen sind und inwieweit die Intervention auf andere Sportarten übertragen werden kann.

## KEY WORDS:

Sports Therapy, Group Dynamics, Perspective Taking, Communication Skills, Social Responsibility.

## SCHLÜSSELWÖRTER:

Sporttherapie, Gruppendynamik, Perspektivenübernahme, Kommunikationsfähigkeit, soziale Verantwortung



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## Introduction

Numerous pieces of evidence support positive associations between sports therapy interventions and psychological and physical effects (2, 26, 19). Sports therapy effects on global psychological constructs such as reduction of depressive symptomatology, etc., have previously been studied so far (12, 16). Less focus was placed on specific therapy goals in forensic psychiatry. Furthermore, the practice of evaluating

sports therapy effects in forensic psychiatry is still in its infancy (22), especially with regard to psychosocial effects (23). The literature points to further research is needed to provide disease-specific therapy recommendations for each patient and to further differentiate sports therapy (20). Four goals in sports therapy have been identified for this specific group of patients (22). One of these goals is 'promoting or

building different components of social competences' (22). The following study analyzed the extent to which a special volleyball training titled 'Group Dynamics in Volleyball Program' (GDiVP) improves different components of social competences in forensic patients. People who can adapt to social environmental conditions are described as socially competent (13). The three basic areas of social competence in sports are perspective taking, communication skills, and social responsibility (27). The majority of offenders in forensic detention show relatively severe impairment in these skills (5, 8). Therefore, social competence is a relevant therapeutic goal in forensic sports therapy because it is associated with better aggression and impulse control and conflict resolution strategies (22, 7, 26) and can be taught across different sports (10, 24). Two RCTs show that weekly soccer training sessions have a positive effect on the social skills of schizophrenic patients when they train regularly over several months (4, 29). Only one study involving forensic patients was found in the literature evaluating the effects of an exercise program (30). One sport that is frequently played in forensic psychiatry is volleyball, as there is a wealth of experience in that field as well as interest and motivation among patients due to the weekly sports therapy sessions.

The combination in our study of a) a targeted sports intervention with specific exercises, b) the team sport volleyball and c) the clientele of forensic psychiatric patients, is a completely novel approach in the literature concerning how social competence can be trained during sports therapy.

### Aim of the Study

The purpose of this study was to examine whether GDiVP could be used to improve three components of socially competent behavior in forensic psychiatric patients: perspective taking, communication skills, and social responsibility. The intervention lasted four hours on each of three consecutive days and included specific sport tasks alternating with moderated group discussions on the topics of rules, communication and differences in performance (see supplemental material, online only).

Two hypotheses were tested: Participation in the volleyball intervention would improve perspective-taking skills (H1a), communication skills (H1b), and social responsibility skills (H1c), whereas the control group would not improve (within-group changes). There would be a significant difference between the IG and the CG in perspective-taking skills (H2a), communication skills (H2b), and social responsibility skills (H2c) after the intervention, but not before the intervention (between-group differences).

## Methods

### Sample and Recruitment

German forensic psychiatric units house mentally ill forensic patients (Section 63 of the German Penal Code) (21) suffering from schizophrenia, personality disorder or intelligence reduction (23) as well as substance-dependent patients (Section 64 of the German Penal Code) (21) who are dependent on alcohol or drugs (23). In addition to the psychiatric clinical pictures and comorbidities, patients also exhibit sociopsychological deficits (23). Patients in both sections took part in the control group as well as in the intervention group.

In 2018 and 2019, data collection took place at the Center for Psychiatry Reichenau. Participation in GDiVP was voluntary, but agreement to participate obligated patients to participate in each day of the project. The intervention group

(IG) included 19 patients, but some subjects dropped out due to illness ( $n = 3$ ) or a lack of motivation ( $n = 1$ ). Data from 15 subjects could be evaluated. The control group (CG) included 26 patients who performed regular sports therapy like the intervention group. One patient in the CG dropped out, so data from 25 patients could be evaluated. On average, subjects in the CG were  $M = 35.24$  ( $SD = 11.53$ ) years old (range: 21 to 59 years), and 84.6% ( $N = 22$ ) were male. Subjects of the IG were  $M = 30.00$  ( $SD = 7.93$ ) years old (range: 20 to 55 years), and 83.3% ( $N = 15$ ) were male. As the descriptive data shows, there were more male patients than female patients, which is representative of forensic patients (18).

### Procedure

The GDiVP study used a pre-post control group design. Randomization of group membership was not possible. Patients in the IG participated in a three-day volleyball workshop (Friday-Sunday) for four hours each day, while patients in both the CG and the IG participated in volleyball games that took place during weekly sports therapy sessions. Assessment of social competence took place at the beginning and end of the intervention and, for the CG, during the ordinary weekly sports therapy sessions both before and after the GDiVP weekend.

### Survey Instruments

Demographics. Age, gender, height, weight, and body mass index (BMI) were recorded (patients' self-reports).

Social competence. To rate socially competent behavior via behavior observation, we developed an evaluation sheet (Appendix 2) assessing the three dimensions of social competence in sports (27): perspective taking (PT), communication skills (CS), and social responsibility (SR). Since no scientifically based measurement instrument with possible application to sports could be found, we developed this evaluation sheet, which was based in terms of theory on Sygusch (27). Two subcategories were assigned to each of the three components of social competence (27). A total of 13 items (PT=2, CS=4, SR=7) were specifically designed and formulated to apply to situations during the volleyball game in order to allow PT (e.g., recognition of and reaction to problems experienced by teammates/opponents in a game situation (movement/technique)), CS (e.g., the use of concise/brief instructions) and SR (e.g., adherence to agreed-upon rules) to be observed in a standardized way. The evaluation sheet contains a three-point Likert scale (coding 0-2). Subscores for each subcategory were added; thus, the maximum score differed per subscale (PT=4, CS=8, SR=14). To estimate the construct validity of our evaluation sheet, we correlated its data with relevant subscales of the Essen Resource Inventory (ERI) (28) (social competence: 6 items) and the Inventory of Social Competences (ISC) (14) (pro-sociality: 7 items; perspective taking: 6 items) of a subsample ( $N = 7$ ). Due to the small sample size, we used Spearman's rho for correlation analysis and identified a coefficient of  $r = .81$ .

### Intervention

The GDiVP intervention schedule is presented in clear, chronological order in the appendix (Appendix 1). The volleyball intervention took place from Friday to Sunday. Over the course of the three-day volleyball weekend, patients were trained in three different components of social competence in sports: PT, CS and SR. The learning fields of 'rules' and 'recognizing and considering differences' were drawn from Balz (3). 'Communication skills' were trained by means of our own tasks, which were developed in accordance with Balz (3). >

Table 1

Values of the descriptive analysis at measurement times 1 and 2. pt=perspective taking; cs=communication skills; sr=social responsibility; cg=control group; ig=intervention group.

VARIABLE	N <sub>1</sub>	N <sub>2</sub>	MIN <sub>1</sub>	MIN <sub>2</sub>	MAX <sub>1</sub>	MAX <sub>2</sub>	MEAN <sub>1</sub> (SD)	MEAN <sub>2</sub> (SD)	DIFFERENCE
pt cg	25	25	0	0	1.5	2	.44 (.49)	.66 (.51)	.22
pt ig	18	15	0	0	1.5	2	.60 (.51)	1.10 (.60)	.50
cs cg	25	25	0	0	2	2	.73 (.65)	.79 (.61)	.06
cs ig	18	15	0	0.25	1.5	2	.57 (.46)	1.15 (.51)	.49
sr cg	25	25	0.43	0.57	1.71	2	1.13 (.35)	1.15 (.39)	.02
sr ig	18	15	0.29	0.29	1.43	2	.92 (.43)	1.50 (.53)	.61

## Data Analysis

T tests for dependent samples were used to calculate the differences between the two time points measured (within-group changes), and t tests for independent samples were used to calculate the differences between both groups (between-group differences). The data was checked for t test assumptions. None of the assumptions were violated, except that the data were not normally distributed. Since linear models are typically understood to be robust against the violation of the normality assumption (6, 15), the t test was still the statistical method of choice. To show changes between pre- and postintervention, we calculated a difference value (post value minus pre value) for each scale and group. We hypothesized that the volleyball intervention would improve social competence in the IG (H1a, H1b, H1c) but not in the CG and that the difference between the two groups would not be significant before the intervention (H2a, H2b, H2c), but would be significant after the intervention (Figure 1). To test the effectiveness of GDiVP and to reduce the risk of type I errors, a Bonferroni correction was conducted.

## Results

### Descriptive Results

All differences in values were positive, even though the increases were lower in the CG group, showing an increase on all scales (Table 1).

### Inferential Results

To test the hypotheses concerning of within-group changes (H1a, H1b, H1c), we calculated a t test for dependent samples. Each hypothesis has two predictions, one for the IG and one for the CG. For the between-group differences (H2a, H2b, H2c), we calculated a t test for independent samples. These hypotheses also have two predictions each, one for measurement time 1 (MT1) and one for measurement time 2 (MT2). Effect sizes were calculated with Cohen's d (9).

### H1: Within-Group Changes

As predicted, the mean value of the IG increased significantly from MT1 to MT2 on all scales: PT (H1a) ( $t(14) = -2.65, p = .019, d = 0.683$ ), CS (H1b) ( $t(14) = -4.25, p = .001, d = 1.100$ ) and SR (H1c) ( $t(14) = -3.66, p = .003, d = 0.946$ ). However, the mean value of the CG had no significant change in CS ( $t(24) = -.88, p = .387, d = 0.176$ ) and SR ( $t(24) = -.50, p = .618, d = 0.101$ ). In contrast to our hypothesis, the mean value of the CG increased significantly in PT ( $t(24) = -3.09, p = .005, d = 0.618$ ).

Therefore, five out of six predictions were confirmed (see Figure 2 for all results).

### H2: Between-Group Differences

The second hypothesis also had six predictions, of which four were confirmed. In PT (H2a), the difference between the IG and CG before the intervention was not significant ( $t(41) = -1.47, p = .148, d = 0.317$ ), as was the case for CS (H2b) ( $t(41) = .35, p = .725, d = 0.279$ ). However, at MT2, only PT showed a significant difference ( $t(38) = -2.45, p = .019, d = 0.754$ ), while the difference in CS was not significant ( $t(38) = -1.92, p = .061, d = 0.609$ ). In contrast to our hypothesis in SR (H2c), the difference between IG and CG was significant at both MT1 ( $t(41) = 2.03, p = .049, d = 0.537$ ) and MT2 ( $t(38) = -2.42, p = .020, d = 0.745$ ) (see Figure 2 for all results).

The results were controlled for age and gender. The performance of a Bonferroni correction revealed that the effects of IG improving were stable for CS and SR but not for PT. Furthermore, the difference between IG and CG at MT2 was not significant anymore.

## Discussion

The present study investigated for the first time the effects of the 'Group Dynamics in Volleyball Program' (GDiVP) on the improvement of social competence and thus on concrete therapy goals in forensic psychiatry.

The results show that GDiVP supplies unambiguous hypothesis confirmations in socially competent behavior of forensic psychiatric patients. Before the intervention, the CG and IG did not differ significantly in the three domains (PT, CS, SR) (H2a, H2b, H2c). The CG did not improve significantly from pre- to poststudy. The IG improved significantly from pre- to postintervention in all three domains (H1a, H1b, H1c). After the Bonferroni correction these effects were only present in CS and SR. In the case of H2c, the incorrect prediction even emphasizes the results more sharply, because the CG had a higher MV before the intervention. After the intervention, at MT2, the IG had the higher MV. However, this is only the case in individual tests. For a general statement, the Bonferroni correction must be taken into account: there is no longer a significant difference between CG and IG (no difference to MT2). The results of this study provide preliminary evidence that specific volleyball training might be effective in forensic patients with different psychiatric disorders, but those results have to be confirmed by further studies with larger sample sizes.

The results are consistent with findings of the National Youth Sport Program (NYSP) (20 days over 4 weeks), which included two hours of sport and one hour of enrichment activities (especially social competence training focusing on the development of problem solving and assertiveness skills) each day (1). There was one group of 193 participants who completed the pretest and posttest (1). Social competence improved due to the train-

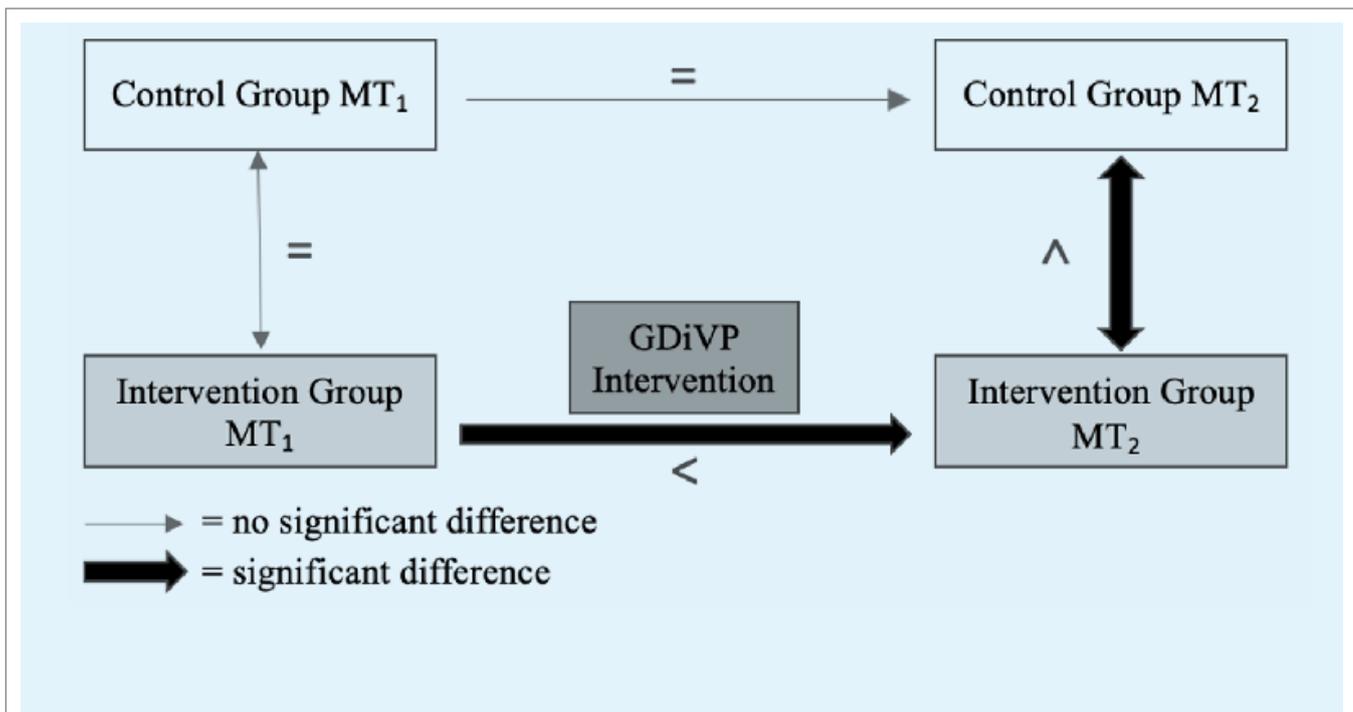


Figure 1

Pre-post control group design.

ing, but not significantly (1). Social competence training is extremely important for youth and should therefore be integrated into sport activities (1). A two-months specific sports program (Sport Education Model (SEM)) was able to produce significant improvements in three components of social competence (social adjustment, prosocial behavior, perceived social efficacy) in adolescents (17). In this program, there was one control group ( $n = 44$ ) and one experimental group ( $n = 69$ ) for which a pretest and a posttest were conducted (17). The results of both studies show that socially competent behavior is very susceptible to training, both in adolescents and in people with underlying psychiatric disorders. As these sports programs continue to evolve and become relevant to people working with these groups of individuals (1), further research in this area is needed. This volleyball study provides an initial approach in the context of the particular clientele of forensic psychiatric patients.

Volleyball was chosen as the team sport for several reasons. On the one hand, there are practical reasons for this decision. The patients are familiar with the game of volleyball from their weekly sports therapy sessions and thus also possess the necessary technical skills, and so a reasonably smooth flow of the volleyball game is guaranteed. The patients' interest in this sport was also greatest. In addition, the volleyball game was quite easy to monitor and observe. On this basis, the exercise blocks on the topics of perspective-taking, communication skills and social responsibility could be integrated very well. With regard to the sociopsychological deficits (23) of forensic patients mentioned at the beginning, social skills from a sport scientific perspective (27) are an important topic in forensic psychiatry. We built our exercises by using the suitable learning fields of Balz (3) as a guideline.

### Feasibility of the Volleyball Intervention

The exercise unit 'establishing and adhering to rules' was easy to implement. The patients came up with a number of rules to which they adhered and which contributed to a better flow of the game (for example: no block on the serve, ball into the net

or on the floor = point for opponent, at most 3 contacts with the ball, all body parts allowed, no pushing of the ball = only brief contact with the ball, hitting of the ball allowed on 1st contact). The adaptation of some rules was also able to be implemented well by the patients (2 ball contacts mandatory, whoever goes to the ball must say 'yes', ball must be received with both hands). The results of the exercise 'communication among one another' were mixed. The exercise that involved calling the name of the teammate who is being targeted worked very well, while the exercise that involved calling one's own name or naming the action before it is played was difficult for the patients to implement. The exercise 'recognize and consider differences' was also difficult for the patients to solve. The patients were good at recognizing and discussing physical and psychosocial differences in performance beforehand, but during the volleyball game, it was consistently difficult to compensate for these differences because of position changes during to the game.

### Limitations

The sample represents a very specific group, as the majority of forensic patients have several comorbidities in addition to the main diagnosis (schizophrenia, personality disorder, intelligence reduction, dependency on alcohol or drugs (23)). Furthermore, only patients of the Center for Psychiatry Reichenau were recruited for the study, which is why the results can hardly be generalized.

With regard to the intervention, the recording of CS turned out to be relatively uncomplicated, whereas the items of PT and SR were difficult to record within the short observation time. Thus, it was a clear advantage to the observer that the patients were familiar from the weekly sports therapy.

However, the results of this study should not be considered as generally valid. The data collection was carried out by a sports therapist. This person knew the patients from weekly sports therapy. Thus, halo bias (the influence of previous information on subsequent evaluations) (11) cannot be excluded. >

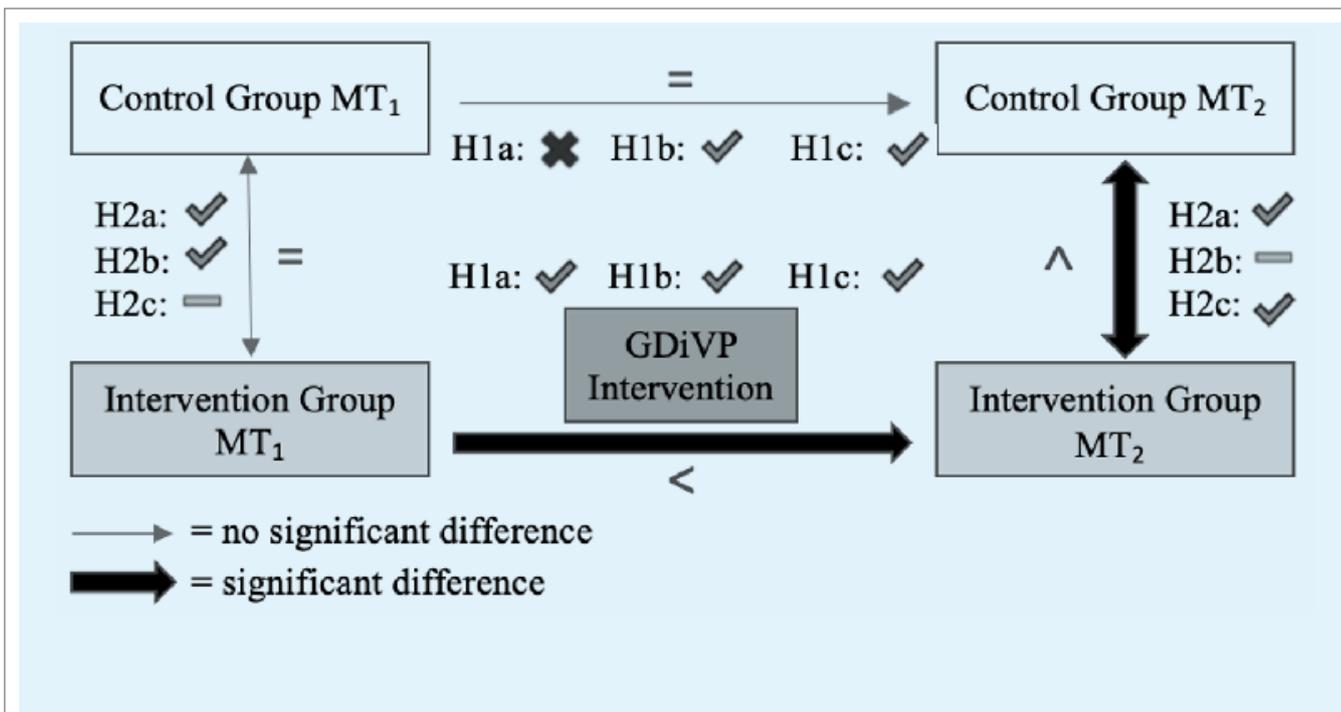


Figure 2 Testing the hypotheses. ✓: predictions confirmed; X: predictions not confirmed.

Furthermore, it should be noted that the observation sheet was self-developed, although it showed acceptable construct validity. The application of the observation sheet by those who are unfamiliar with it is therefore considered difficult and requires precise explanation with concrete examples for the 13 items. The Hawthorne effect (change in behavior as a response to observation and assessment) (25) can be excluded since the participants of the study were only informed that the intervention is intended to promote 'better interaction' and not that concretely the three components of socially competent behavior are examined concretely. Due to the small number of subjects, we cannot investigate the moderating effect.

Implication

A relevant therapeutic goal in forensic inpatient treatment is to improve social competence. This study preliminary supports the finding that a sports therapy intervention can contribute significantly to this goal. Further studies must determine how sustainable the positive changes are and to what extent the intervention can be transferred to other sports (e.g., soccer or climbing).

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Conflict of Interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest (such as honoraria, educational grants, participation in speaker's bureaus, membership, employment, consultancies, stock ownership, or other equity interest, expert testimony or patent-licensing arrangements) or nonfinancial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

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