



The Role of Physical Health, Sexuality, and Social Support as Predictors of Academic Stress Among College Students: a Biopsychosocial Model

María Eugenia Reyes-Pedraza*¹ , Noé Emmanuel Del-Real-García²
María Delia Tellez-Castilla³

^{1,2,3} Universidad Autónoma de Nuevo León, Av. Universidad s/n 66455, San Nicolás de los Garza, N.L., México

¹maria.reyespd@uanl.edu.mx,

²noe.realgr@uanl.edu.mx, ³tellezdelia64@gmail.com

Abstract. Academic stress among college students is a multifaceted phenomenon that requires explanatory models incorporating biological, psychological, and social factors. The present study examined the predictive power of physical health, social support, and gender on perceived stress among 761 Mexican college students (56.6% male) using a quantitative cross-sectional design. Psychometrically validated composite indices were constructed, and a hierarchical multiple regression was applied across four sequential models. Results indicated that physical health was the strongest predictor of stress ($\beta = .46$, $p < .001$), followed by sex ($\beta = -.27$, $p < .001$, with men reporting higher stress) and social support ($\beta = -.22$, $p < .001$). The final model explained 23.3% of the variance in stress ($R^2 = .233$, $F = 37.10$, $p < .001$). Time management was not a significant predictor when controlling the other factors. Important sex differences were identified in correlation patterns: in men, stress was significantly associated with wellbeing ($r = -.29$) and social support ($r = -.20$), whereas in women these associations were not significant. These results support a biopsychosocial model of university stress in which physical health operates as the primary predictor, with differential implications by sex for the design of preventive interventions.

Keywords: public health, public policies, multiple regression.

1 Introduction

The biopsychosocial model (BPS model) posits that in order for traditional medicine to understand and address illness, it must not only attend to the patient but also examine the conditions in which they live and their social environment, providing treatment to the individual alongside community-level healthcare. This model transcends conservative canons by focusing attention on the triad of physical, psychological, and social factors, and understands health and illness through this dynamic, integrated perspective [1].

Among the mental health problems that most significantly affect human beings is stress, a topic of great interest to public health. Stress is defined as a negative response that disrupts homeostasis in those who experience it, arising from the contrast between pressures of any kind and the individual's capacity to cope with those challenges [2]. Such effects have a significant impact across different domains of daily life, including family, social, occupational, and academic spheres [3].

Consistent with the above, academic stress occupies an important place of attention in contemporary university context. This finding is supported by the results of a survey carried out across more than 145 countries, which revealed that 37% of the population reported high levels of stress. This indicates that a significant proportion of the global population suffers from this condition. [4-5-6]. These studies conducted around the world show that most college students experience moderate to high levels of stress throughout their academic careers. In addition, a 2025 survey conducted by the American College Health Association (American College Health Association)—the National College Health Assessment—confirmed that three out of four college students reported feeling stressed, and one in five stated that stress had led them to have suicidal thoughts [7-8].

Various factors have been identified as contributors to feelings of stress in university students [9-10]. Academic stress is conceptualized as a physical and emotional reaction to demands perceived as excessive by students. Emotional expressions such as anxiety, emotional exhaustion, and frustration tend to manifest as the academic period progresses and students face assignments, examinations, and academic exercises, compounded by deadline pressures [11].

Academic stress is also defined as the result of interactions between demands issued by university faculty, combined with students' perceptions and the resources available to them for coping with such demands—including physical, socio-affective, and cognitive resources. This refers to all that which the student is unable to manage within their academic processes, and which affects their performance [12].

From a theoretical perspective, [13], argue that academic stress results from the interaction between high perceived demands and available coping resources. Under this framework, vulnerability to stress involves not only external academic factors, but also internal resources such as physical health and social resources such as perceived support from one's environment.

Academic stress is further compounded by additional elements, including alcohol and substance use, risk behaviors, and dysfunctional family dynamics, all of which severely impact students' academic functioning [14]. Family represents an unconditional source of support for students' quality of life, and experiencing family conflict is associated with significant levels of stress [15]. These high levels of stress, manifested as anguish, distress, intolerance to pressure, and nervousness, among other symptoms [16], can ultimately lead to poor academic performance [17].

Studies such as those by [18], have shown that academic stress is not a persistent phenomenon; rather, there are periods when it intensifies due to the academic workload, times when students feel more overwhelmed and begin to wonder whether they should continue their college studies. According to [19], stress can affect not only academic

performance and graduation rates but also the physical and psychological health of college students.

The World Health Organization (WHO) affirms that health is not merely the absence of disease or infirmity, but encompasses a state of complete physical, mental, and social wellbeing. Physical health is an integral component of this concept—an indispensable element of overall wellbeing that is deeply linked to proper bodily functioning and the ability to carry out daily activities without impediment. Positive health behaviors that promote this state and reduce stress include physical activity, healthy eating, and adequate sleep [20].

In relation to the subject of sex, the majority of research findings report that women have a greater perception and intensity of stress [21]. This discrepancy suggests that gender may act as a moderator of the relationship between emotional resources and stress, rather than functioning as a direct predictor of stress levels [21-22].

Social support is one of the protective factors that aids students' emotional resilience. Individual, family, social, and organizational characteristics can act independently or in synergy to reduce the development of mental health problems or facilitate recovery, as well as to counteract potential negative effects [23]. Studies in positive psychology and mental health have demonstrated that these support networks are equally important to risk reduction [24]. In the university setting, protective factors range from family support and interpersonal relationships to academic support, access to mental health services, and extracurricular activities [25]. It is also important for student wellbeing that universities provide supportive academic climates [26]. This finding aligns with the buffering effect theory [27], which posits that students' ability to cope with stressors is contingent on their access to sufficient cognitive, emotional, and instrumental resources.

The objective of this study is to examine the predictive power of physical health, sex, social support, and time management on perceived stress in Mexican university students, utilizing a hierarchical multiple regression model. Furthermore, the study explores the potential disparities in the associations between these factors and stress based on gender. The following working hypotheses have been postulated: It is hypothesized that physical health, social support, and sex will be significant predictors of stress. It is further hypothesized that time management will not add significant predictive power to the model after controlling for the other factors. It is finally hypothesized that the correlation patterns between stress, wellbeing, and social support will differ significantly by sex.

2 Method

2.1 Design and Participants

The present study employed a non-experimental, cross-sectional, and quantitative design. A non-probability convenience sampling procedure was used to recruit participants from the Autonomous University of Nuevo León UANL. Participants were invited to complete an anonymous survey distributed via Microsoft Forms, with recruitment conducted through multiple digital communication channels: email,

Microsoft Teams, and Classroom announcements. All students were informed about the study procedures and provided voluntary informed consent prior to participation.

The sample consisted of 761 Mexican university students: A total of 431 male participants (56.6%) and 320 female participants (42.1%) were included in the study. However, 10 participants who identified as of another gender (1.3%) were excluded from sex-comparative analyses due to the small size of their respective subgroups.

Inclusion criteria comprised: (1) being enrolled as an active student at UANL, (2) being 18 years of age or older, and (3) being willing to complete the anonymous survey. The data indicates that 79.6% of the students were enrolled in public universities, while 20.4% were enrolled in private institutions. With respect to socioeconomic status, 80.6% of the sample population were classified as being in the middle stratum, 15.1% in the low stratum, and 4.3% in the high stratum.

The survey was completely anonymous, and participants' personal data were protected. All procedures were approved by the institutional ethics committee.

2.2 Instrument

The survey administered covered university lifestyle with 68 items measured on a five-point Likert scale (1 = never/strongly disagree to 5 = always/strongly agree). The following dimensions were used:

Stress (8 items; $\alpha = .894$): assessed the presence of cognitive, emotional, and physical symptoms of academic stress (e.g., difficulty relaxing, feeling overwhelmed, physical symptoms associated with stress).

Physical health (9 items): a composite index integrating subscales of physical activity (3 items), diet (3 items), and sleep (3 items). Given that alpha coefficients per subscale were below .70, items were analyzed through a global averaged index after recoding five reverse-worded items.

Social support (8 items; $\alpha = .719$): measured perceived support from friends, family, and the university environment, as well as the quality of interpersonal relationships.

Perceived wellbeing (3 items; $\alpha = .763$): assessed work-study balance, compatibility with health, and self-care.

Time management (3 items; $\alpha = .516$): measured the capacity for planning and managing academic time, with one procrastination item reverse-coded.

University resources (6 items; $\alpha = .818$): assessed knowledge of and use of university wellbeing support services.

2.3 Analytical Procedure

Analyses were conducted using Stata 18. Descriptive statistics were calculated and Student's t-tests were performed for sex comparisons with Cohen's d effect size estimation. Pearson correlation matrices were computed for the total sample and by sex subgroup.

The dependent variable was the stress index. A hierarchical multiple regression model was constructed in four sequential steps to evaluate the incremental contribu-

tion of each predictor: Model 1 (physical health), Model 2 (+ social support), Model 3 (+ sex), and Model 4 (+ time management). Standardized coefficients (β), R^2 for each model, and the increment in R^2 (ΔR^2) are reported. The absence of multicollinearity was verified using the Variance Inflation Factor (VIF). Normality of residuals was confirmed with the Shapiro-Wilk test ($W = 0.998$, $p = .477$).

3 Results

3.1 Descriptive Statistics and Sex Comparisons

Table 1 presents descriptive statistics and sex comparisons. The only predictor that showed a significant difference between men and women was stress ($t(749) = 3.81$, $p < .001$, $d = .28$), with men reporting higher levels ($M = 3.53$ vs. 3.30). The effect size was small to moderate. Our analysis revealed no statistically significant differences in terms of physical health, social support, wellbeing, or university resource use.

Table 1 Descriptive Statistics, Means, and Sex Comparisons for Study Variables (N = 751)

Variable	Men (n=431)		Women (n=320)		t	p	d
	M	SD	M	SD			
Stress	3.53	.82	3.30	.81	3.81	<.001	.28
Physical health	3.27	.47	3.31	.59	-	.385	.07
					0.87		
Social support	3.61	.64	3.53	.57	1.42	.156	.13
Wellbeing	3.35	.85	3.42	.83	-	.234	.08
					1.19		
University resources	3.04	.84	3.01	.81	0.43	.668	.04

Note. M = mean; SD = standard deviation; t = Student’s statistic; d = Cohen’s d. ns = not significant. Degrees of freedom for all comparisons are 749.

3.2 Bivariate Correlations

Table 2 presents the correlation matrix between the study's variables. The strongest positive correlation with stress was found in physical health ($r = .38$, $p < .001$), followed by time management ($r = .18$, $p < .001$). Social support and wellbeing were found to be inversely correlated with stress, with respective correlation coefficients of $-.12$ and $-.15$. It is noteworthy that there is a strong relationship between wellbeing and social support ($r = .53$) and between physical health and time management ($r = .56$). This suggests that there are underlying psychosocial factors that influence both areas.

Table 2. Pearson Correlation Matrix Between Study Variables (N = 761)

Variable	1	2	3	4	5	6	M
1. Stress	—						3.43
2. Physical health	.38**	—					3.29
3. Social support	- .12**	.17**	—				3.57
4. Wellbeing	- .15**	.34**	.53**	—			3.38
5. University resources	-.04	.32**	.35**	.55**	—		3.03
6. Time management	.18**	.56**	.25**	.41**	.39**	—	3.22

Note. ** $p < .001$. ns = not significant. M = mean.

3.3 Hierarchical Multiple Regression

Please refer to Table 3, which presents the results of the four hierarchical regression models. In Model 1, which used only physical health as a predictor, 14.3% of the variance in stress was explained ($R^2 = .143$, $\beta = .38$, $p < .001$). The incorporation of social support in Model 2 notably augmented its explanatory capacity by 5 percentage points ($\Delta R^2 = .050$, $p < .001$), while both original predictors retained their statistical significance ($\beta = .43$ for physical health; $\beta = -.21$ for social support; both $p < .001$).

Model 3, upon including sex, added a significant additional increment ($\Delta R^2 = .039$, $p < .001$), reaching $R^2 = .232$. The results of the study indicated that male subjects reported higher levels of stress compared to female subjects, when controlling for other potential predictors ($\beta = -.27$, $p < .001$). The significance of physical health and social support was sustained, as evidenced by the stability of their coefficients. Finally, Model 4 incorporated time management, which did not add significant explanatory power ($\Delta R^2 = .001$, $p = .997$), thereby confirming hypothesis H2. The final model ($R^2 = .233$) demonstrated a mean VIF of 1.29, thereby eliminating the possibility of multicollinearity.

Table 3. Hierarchical Multiple Regression Models for Academic Stress (N = 761)

Predictor	M1 β	M 1 p	M2 β	M 2 p	M3 β	M 3 p	M4 β	M 4 p	V IF
Physical health	.38**	<.001	.43**	<.001	.45**	<.001	.46**	<.001	1.75
Social support	—	—	-.21**	<.001	-.22**	<.001	-.22**	<.001	1.24
Sex (female)	—	—	—	—	-.27**	<.001	-.27**	<.001	1.02
Time management	—	—	—	—	—	—	.007	.997	1.56
R ²	.143**		.193**		.232**		.233**		
ΔR ²	—		.050**		.039**		.001		

Note. β = standardized coefficient. M1 = Model 1; M2 = Model 2; M3 = Model 3; M4 = Model 4. ** p < .001. VIF = Variance Inflation Factor.

3.4 Sex Differences in Correlation Patterns

Table 4 presents correlations between stress and key psychosocial predictors, disaggregated by sex. A notable differential pattern was identified: in men, stress was significantly correlated with wellbeing ($r = -.29$, $p < .001$) and social support ($r = -.20$, $p < .001$); in women, these associations did not reach statistical significance ($r = -.02$ and $-.09$, respectively). Conversely, the association between stress and physical health was significant and comparable in both groups, with correlation coefficients of .35 in the male sample and .40 in the female sample. These differences support hypothesis H3 and suggest that, in men, stress has a more pronounced psychosocial component, whereas in women, the stress-physical health link is the dominant pattern.

Table 4. Correlations Between Stress and Psychosocial Predictors by Sex

Relationship		r	p	r	p	Difference	Sig.
		Men		Women			
Stress ↔ Physical health	9	.34	<.001	.402	<.001	+.053	Ns
Stress ↔ Social support	.202	-	<.001	-.087	.121	-.115	*
Stress ↔ Wellbeing	.285	-	<.001	-.024	.673	-.261	**
Physical health ↔ Wellbeing	2	.30	<.001	.364	<.001	+.062	ns

Note. * $p < .05$; ** $p < .001$. ns = not significant. Differences between correlation coefficients were evaluated using Fisher's Z-test.

4 Discussion

The study examined biopsychosocial predictors of academic stress in Mexican university students using a hierarchical regression model. The results provide convergent evidence with the biopsychosocial theoretical framework and offer important nuances regarding differential patterns by sex. In the analysis, physical health was identified as the strongest predictor of stress, with a beta value of .46. This result superseded the impact of both social support, with a beta value of -.22, and sex, with a beta value of -.27. This result is consistent with research documenting the close interdependence between health behaviors and stress response [28-29]. Although the cross-sectional design does not permit establishing causal direction, the effect size suggests that the simultaneous deterioration of multiple health behaviors—including insufficient physical activity, poor diet, and sleep disturbances—may act as amplifiers of perceived stress, or alternatively, that chronic stress deteriorates the set of healthy behaviors. Longitudinal evidence supports the bidirectionality of this relationship [30].

Social support showed a significant negative association with stress ($\beta = -.22$), consistent with the buffering effect theory [27]. However, when examining patterns by sex, this protective effect was significant only in men ($r = -.20$) and did not reach significance in women ($r = -.09$). A possible explanation lies in sex differences in coping styles: women tend to use emotion-focused coping strategies and social support-seeking as their first-line response to stress, which may reduce the residual variability in the support-stress association [31]. In contrast, men may benefit more from social support precisely because they use it less frequently as a coping strategy.

The most counterintuitive finding of the study was that men reported significantly higher stress levels than women ($t = 3.81$, $d = .28$), contrary to the trend reported in the international literature [32]. This result may be explained by specific cultural factors in the Mexican context, such as gender role expectations associated with academic performance and provider pressure in male university students, or by self-disclosure

biases that differentially affect men and women in Latin American contexts [33]. Furthermore, the differential correlation pattern—with men showing a stronger association between stress and wellbeing—suggests that when men do experience and report stress, it has a more pronounced impact on perceived wellbeing.

Time management was not a significant predictor of stress when controlling for other factors ($\beta = .00$, $p = .997$). However, it showed a positive bivariate correlation with stress ($r = .18$). This statistical suppression—where the bivariate association disappears when other variables are controlled—can be explained by the high correlation between time management and physical health ($r = .56$). Once physical health is controlled, the variance in stress explained by time management is captured. In essence, the impact of time management on stress may be mediated by its influence on health behaviors.

4.1 Limitations

It is important to note the limitations of this study: the cross-sectional design precludes causal inference. Non-probability sampling limits generalizability. The time management scale demonstrated low internal consistency ($\alpha = .516$), necessitating a cautious interpretation of results for this variable. The operationalization of physical health as a global index combines subscales with alpha coefficients below .70. This may introduce measurement imprecision. Future research should employ specifically validated scales for each component of physical health.

5 Conclusions

This study contributes to our understanding of college stress from a biopsychosocial perspective, identifying three main findings. First, physical health emerges as the strongest predictor of stress, with an effect size that exceeds both social support and sex. This underscores the significance of interventions aimed at promoting healthy behaviors—such as physical activity, healthy eating, and adequate sleep—within university wellness programs. Secondly, social support functions as a protective factor against stress, particularly for men, indicating the necessity for sex-differentiated strategies in institutional support provision. Thirdly, the prevailing literature on the subject is contradicted by the findings of this study, which reported that Mexican male university students exhibited higher levels of stress compared to their female peers.

This finding necessitates further consideration in the formulation of university mental health policies, which often prioritize women as the higher-risk demographic. From a pragmatic standpoint, these findings imply that university wellness initiatives would be well-advised to adopt a holistic strategy that integrates the promotion of physical health behaviors with the facilitation of social support, paying particular attention to the needs of male students. Early identification of students with low perceived social support and deteriorating health behaviors may constitute an effective strategy for the prevention of academic stress.

References

1. Engel, G. L.: The need for a new medical model: A challenge for biomedicine. *Science*, 196, 129–136 (1977).
2. Silva-Ramos, M., López-Cocotle, J., & Columba, M.: Academic stress in university students. *Investigación y Ciencia*, 28(79), 75–83 (2020).
3. Kapil, M., Rostampour, R., & Hadwin, A.: Coping self-efficacy and stress mindset as predictors of student success outcomes. *Journal of Postsecondary Student Success*, 4(1), 147–172 (2024).
4. Gallup. Global emotions report. Gallup, Inc. <https://news.gallup.com/reports/212678/2017-global-emotions-report.aspx> (2017).
5. Gallup. Global emotions report 2018. Gallup, Inc. https://www.gallup.com/file/analytics/241961/2018_Global_Emotions_Report_9_14.pdf (2018).
6. Gallup. Global emotions report 2023. Gallup, Inc. <https://www.scribd.com/document/663328550/Gallup-2023-Global-Emotions-Report> (2023).
7. Liu, X., Ping, S., & Gao, W.: Changes in undergraduate students' psychological well-being as they experience university life. *International Journal of Environmental Research and Public Health*, 16, 2864 (2019).
8. American Psychological Association. (2020). *Stress in America™ 2020: A National Mental Health Crisis*. Washington, DC: American Psychological Association.
9. Reddy, K. J., Menon, K. R., & Thattil, A.: Academic stress and its sources among university students. *Biomedical & Pharmacology Journal*, 11(1) (2018).
10. Karyotaki, E., Cuijpers, P., Albor, Y., Alonso, J., Auerbach, R. P., Bantjes, J., et al.: Sources of stress and their associations with mental disorders among college students: Results of the WHO World Mental Health Surveys International College Student Initiative. *Frontiers in Psychology*, 11, 1759 (2020).
11. Campbell, F., Blank, L., Cantrell, A., Baxter, S., Blackmore, C., Dixon, J., & Goyder, E.: Factors that influence mental health of university and college students in the UK: A systematic review. *BMC Public Health*, 22, 1–22 (2022).
12. Vega-Martínez, A., Martínez-Fernández, J. R., & Coiduras-Rodríguez, J.: Learning patterns, academic stress, and performance in first-year university students: An exploratory study. *Educar*, 59(1), 163–178 (2023).
13. Lazarus, R. S., & Folkman, S. *Stress, appraisal, and coping* (1.^a ed.). New York, NY: Springer Publishing Company (1984).
14. Muñoz-Donoso, D., Soto-Sánchez, J., et al.: Physical activity level and academic stress perceived by university health students during exam periods. *Retos*, 49, 22–28 (2023).
15. Wynne, S., & Garrow, A.: Exploring the motivations, expectations, and experience of graduate-entry nursing students: A qualitative research study. *Nurse Education Today*, 142, 1–8 (2024).
16. Shiraly, R., Roshanfekar, A., Asadollahi, A., & Griffiths, M. D.: Psychological distress, social media use, and academic performance of medical students: The mediating role of coping style. *BMC Medical Education*, 24(1), 1–11 (2024).
17. Rodríguez-Fernández, A., Maury-Sintjago, E., et al.: Academic stress and coping strategies in health science students in Santiago, Chile. *Revista Educación Médica del Centro*, 12(4), 1–16 (2020).

18. Lahme, S. Z., Cirkel, J. O., Hahn, L., Hofmann, J., Neuhaus, J., Schneider, S., & Klein, P.: From enrollment to exams: Perceived stress dynamics among first-year physics students. *Physical Review Physics Education Research*, 20(2) (2024).
19. Rehman, M., Jawad, Z. S., & Bano, S.: Level of academic stress and its influence on the academic achievements of students at Mirpur University of Science and Technology. *SJESR*, 6, 169–175 (2023).
20. World Health Organization. Constitution of the World Health Organization. <https://www.who.int/about/governance/constitution> (1948).
21. Graves, B. S., Hall, M. E., Dias-Karch, C., Haischer, M. H., & Apter, C. (2021). Gender differences in perceived stress and coping strategies among college students. *PLoS ONE*, 16(8), e0255634.
22. Zamora Betancourt, M. R., Caldera Montes, J. F., & Guzmán Valderrama, M. G.: Academic stress and social support in university students. *Dilemas Contemporáneos: Educación, Política y Valores*, 9(spe1), 00011 (2021).
23. Farhane-Medina, N. Z., Luque, B., Tabernero, C., & Castillo-Mayén, R.: Factors associated with resilience in medical students: A systematic review. *International Journal of Environmental Research and Public Health*, 19(16), 10194 (2022).
24. Zeng, G., Peng, K., & Hu, C.-P.: The network structure of adolescent well-being traits: Results from a large-scale Chinese sample. *Frontiers in Psychology*, 10, 2783 (2019).
25. Worsley, J. D., Pennington, A., & Corcoran, R.: Supporting mental health and wellbeing of university and college students: A systematic review of review-level evidence of interventions. *PLOS ONE*, 17(7), e0266725 (2022).
26. Lattie, E. G., Adkins, E. C., Winkquist, N., Stiles-Shields, C., Wafford, Q. E., & Graham, A. K.: Digital mental health interventions for depression, anxiety, and enhancement of psychological well-being among college students: Systematic review. *Journal of Medical Internet Research*, 21(7), e12869 (2019).
27. Cohen, S., & Wills, T. A.: Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, 98(2), 310–357 (1985).
28. Eisenberg, D., Gollust, S. E., Golberstein, E., & Hefner, J. L.: Prevalence and correlates of depression, anxiety, and suicidality among university students. *American Journal of Orthopsychiatry*, 77(4), 534–542 (2007).
29. Stults-Kolehmainen, M. A., & Sinha, R. (2014). The effects of stress on physical activity and exercise. *Sports Medicine*, 44(1), 81–121.
30. Warburton, D. E. R., & Bredin, S. S. D.: Health benefits of physical activity: A systematic review of current systematic reviews. *Current Opinion in Cardiology*, 32(5), 541–556 (2017).
31. O'Connor, D. B., Jones, F., Conner, M., McMillan, B., & Ferguson, E.: Effects of daily hassles and eating style on eating behavior. *Health Psychology*, 27(S1), S20–S31 (2008).
32. Tamres, L. K., Janicki, D., & Helgeson, V. S.: Sex differences in coping behavior: A meta-analytic review and an examination of relative coping. *Personality and Social Psychology Review*, 6(1), 2–30 (2002).
33. Rivera-Ledesma, A., & Montero-López, M.: Spirituality and religiosity in older Mexican adults. *Salud Mental*, 28(6), 51–58 (2010).

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

